



**THE PROJECTED RAILWAYS.—ANALYSIS of the PATENT METALLIC SAND, or ENGLISH POZZOLANO, used in the foundations of the New House of Parliament, the great tunnels on the Birmingham Railway, seawall on the Great Western Railway, in Devonshire, and other important works, referred to more particularly in the prospectus:**

Silica	49	Magnesia	2
Oxide of iron	32	Zinc	3
Alumina	6	Arsenic and carbonate of copper	2
Lime	6		

Used as an external Stucco, the Metallic Sand Cement is cheaper than Roman Cement—unaffected by frost or wet—in appearance resembles the best Portland stone—requires neither colour nor paint—and is entirely free from vegetative cracks and blisters, to which Roman Cement is liable.

Price in Swans, free on board ..... 6d. per bushel; 29

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#### PATENT VALVES,

#### APPLICABLE TO PUMPS OF EVERY

#### DESCRIPTION.

The superiority of these valves, as economical in respect both of trouble and expense, has been proved, by the experience of their GENERAL USE for more than SEVEN YEARS.

The valves refer to nearly all the water-works, engineers in the kingdom, by whom satisfactory testimonials have been freely given.

The principle adopted is that of "OBTAINING THE GREATEST WATER PASSAGE BY THE LEAST POSSIBLE PRESSURE AREA," thereby avoiding the great concession occasioned by the closing of ordinary valves, and the loss caused by letting in air under them.

Until the invention of these valves (first used at the East London Water-Works), the most economical mode of raising water—viz., by the plunger-pump, and the principle of expansive steam, as practised in Cornwall, was impracticable for water-works purposes.

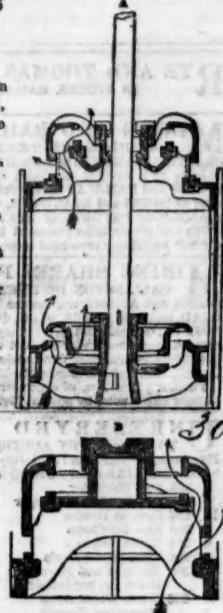
Sketch A shows the manner in which the valves have been applied to air-pumps of steam-engines. Sketch B, the manner of their application to pumps for lifting water.

The valves are shown open in both Sketches.

Address Messrs. HARVEY and WEST,  
HAILE FOUNDRY, CORNWALL.

PRINCIPAL MANUFACTURERS.

Messrs. HARVEY and CO.,  
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**TO ENGINEERS, RAILWAY CONTRACTORS, &c.—The PATENT RIVET COMPANY OF SCOTLAND, 25, BROWN STREET, Glasgow, MANUFACTURE (under the superintendence of the acting partner, Mr. Alexander G. Gilkison) all descriptions of BOILER and TANK RIVETS, WOOD SCREWS, SCREW BOLTS AND NUTS, RAILWAY SPIKES, &c.**

Orders executed with despatch, and forwarded to all parts of the United Kingdom.

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**DENT'S PATENT DIPLOMOSCOPE, or meridian instrument, is now ready for delivery. Pamphlets containing a description and directions for its use 1s. each, but to customers gratis.**

**ARGUS LIFE ASSURANCE COMPANY.**

30, TENTERMORTON-STREET, BANK.

Empowered by Special Act of Parliament, 5 and 6 William IV., cap. 76.

THOMAS FARNCOME, Esq., Alderman, Chairman.

WILLIAM LEAF, Esq., Deputy-Chairman.

Consulting Actuary—Professor Hall, M.A., of King's College.

LOW RATES OF PREMIUMS.

In addition to the subscribed capital of £300,000, the assured have the security of the company's income of £60,000 per annum, yearly increasing, and an accumulating assurance fund, invested in Government and other available securities, of considerably larger amount than the estimated liabilities of the company.

ANNUAL PREMIUM TO ASSURE ONE HUNDRED POUNDS.

Age.	For One Year.	For Seven Years.	Whole Term.
20	£0 17 8	£0 19 1	£1 11 10
30	1 1 8	1 2 7	2 0 7
40	1 5 0	1 6 9	2 14 10
50	1 14 1	1 19 10	4 0 11
60	3 2 4	3 17 0	6 0 10

One third of the Whole Term premium may remain unpaid at 5 per cent. comp. int., as a debt upon the policy for life, or may be paid off at any time without notice.

The medical officers attend daily at a quarter before Two o'clock.

EDWARD BATES, Resident Director.

A liberal commission to solicitors and agents.

**GREATER BRITAIN MUTUAL LIFE ASSURANCE, 14, WATERLOO-PLACE, PALL-MALL, LONDON.**

THE CHISHOLM, Chairman.

WILLIAM MORLEY, Esq., Deputy-Chairman.

GREAT ADVANTAGES OFFERED TO POLICY HOLDERS BY THIS INSTITUTION.

A large and immediate accession of assurances by the transfer of the policies of the "Achilles British" and Foreign Life Assurance Association."

The whole of the PROFITS DIVIDED annually among the MEMBERS, after payment of five annual premiums.

A ample guaranteed capital, in addition to the fund continually accumulating from premiums, fully sufficient to afford complete security.

CREDIT given to MEMBERS for half the amount of the first five annual premiums without security.

CREDIT allowed to MEMBERS for the whole of the first five annual premiums, on satisfactory security being given for their payment.

Transfers of policies effected and registered (without charge) at the office.

Claims on policies not subject to be litigated or disputed, except with the sanction, in each case, of a general meeting of the members.

An extremely low rate of premium, without participation in the profits, but with the option, at any time within five years, of paying the difference between the reduced rates and the mutual assurance rates, and thus becoming members of the society, and entitled to a full participation in the profits.

### Proceedings of Public Companies.

#### ALTON MINING ASSOCIATION.

A special general meeting of the proprietors in this company was held at the offices, Winchester-house, Old Broad-street, yesterday, to take into consideration the present position of the company.

MR. LABOUCHERE in the chair.

Mr. COLE (the secretary) having read the advertisement convening the meeting, and the minutes of the former meeting which were confirmed, read the following reports from the directors and Mr. Thomas, the agent at Alton:

#### DIRECTORS' REPORT.

We have again to call you together to give an account of another year of disappointed hopes and baffled expectations. When we last had the honour of addressing you, we had every reason to believe—from the then state of various old workings, and, in particular, from one new discovery—that some profit would be made on the current year; as, however, the season advanced, we found that this could not be the case, and that loss was inevitable, which the accounts now laid upon the table show to be 7077.7s. 10d.; still, the advoce continued so good, and, judging from the estimates, that the produce at least equalled the expenditure, we considered ourselves, in the month of October, justified in relaxing the rigour of our former instructions, and authorising our manager to lay out 10*l*. per month in opening ground, and making further explorations; very soon after this, we perceived a most material falling off in the quality of the ore, and the reserves even there, we are now informed, are inconsiderable, so that nothing remains to the present directors but to wind up the association at as early a period as possible, which we calculate can hardly be before the end of the summer of 1845. This will give a fair time to dispose of the concern, should any parties, either amongst the present shareholders or elsewhere, be found willing to make the purchase; or, if it has been suggested to us, that a certain number of new shares might be created, which could be disposed of to such of the shareholders as still entertain a favourable opinion of the undertaking; and we would suggest, that such persons form themselves into a committee, in order to discuss the best method of carrying out a plan, either for purchasing of those shareholders who are unwilling to go on, or for issuing new shares. We own that the board, as a body, shrinks from recommending any particular course. We should merely say, that our opinion is, that a capital of 25,000*l.*, of which 15,000*l.* to be raised immediately, is the least amount required to resume operations with any prospects of success, and that a period of three years must elapse before the mine could be expected to yield any considerable permanent profit. We have only further to add on this subject—

1. That the lodes, in few instances, are worked to any depth—Raipas, which has produced a very large quantity of ore, not being above thirty fathoms in depth.

2. That there are various lodes which have not yet been explored at all.

3. That the smelting is now effected at a very moderate cost—say, £1 13*s.* per ton.

4. That the rate of wages has been reduced 30 per cent. since 1836, and that there is a body of effective workmen on the spot, so that a comparatively moderate profit would give any new body of proprietors purchasing the mines a handsome dividend; and also that Mr. Thomas, who has now returned to Alton, and had great experience both at our mines and at others in Norway, and whose abilities are unquestioned, is still most sanguine as to a favourable result, if the mines are only carried on with spirit and system—and we think it well to read his last report.

Finally, we have to inform you, that, in order to diminish the London expenses, Mr. Pike and Mr. Murray have very handsomely agreed to retire from the direction—Mr. Pike from October last, and Mr. Murray from the present time.

#### AGENT'S REPORT.

Atten Copper-Works, May 21.—Your esteemed favours of the 18th March and 11th ult. reached me with the last post; I have since made the estimates alluded to, and now avail myself of the earliest opportunity of forwarding them. With respect to the reserves of ore at Raipas, they are evidently very trifling; and, as I have before stated, confined almost entirely to the gossan lodes, from which, as will be perceived by the low per centages of both the estimates and returns, the greater part of the present produce is obtained. By reference to the accounts for the last twenty months, it will be seen, that, for the year ending 31st Sept., 1844, 136 men were employed on stonings to 10*l* on levels and shafts; but the latter, instead of exploratory work, were mostly forming communications with other places about shaft No. 1, where the ore had been previously discovered and worked on; therefore, those workings could only be serviceable for ventilating and draining of the part of the mine. Subsequent to last September, and during the present year, the stonings shaft No. 1—from which the principal part of the produce of this mine has, latterly, been derived—began to deteriorate, the ore became more disseminated throughout the matrix, and the gossan part of the lode more confined; in order, therefore, to keep up the supplies of ore, it was found necessary to increase the number of men on stonings, and diminish those on driving and sinking; consequently, the proportion, since October, has been 35 of the former to 1 of the latter. During this period, however, the levels must be considered as entirely exploratory—having been worked on the course of the lode, and the large bunches of gossan, on which our principal workings are now carried on, were therefore discovered. 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## LOCOMOTIVE STEAM-ENGINES.

At the Institution of Civil Engineers, a paper was read by J. G. Bodmer, Mem. Inst. C.E., "On the Advantages of Working Engines with High-pressure Steam Expansive, and at Great Velocities."—The author based his observations upon the principle of a considerable area of piston being essential for taking advantage of the initiative impulse of highly elastic steam, in contradistinction to the idea of the percussive action which had, some time ago, found advocates. In order, therefore, to take advantage of this action, and be enabled to cut off the steam at an early period of the stroke, the piston at short intervals, and, consequently, making a great number of strokes in a given time, must travel over a limited distance, that as little as possible of the heat, and, consequently, of the elasticity, should be lost. It has been generally acknowledged that the action of a short crank and rapid stroke is very disadvantageous to the framing and foundations of ordinary engines. Mr. Bodmer has, in constructing his compensating engines, concentrated the action, and confined the strain to the crank, connecting-rod, and piston-rod. By this construction he has been enabled to carry the expansive principle to such an extent, as to deliver the steam into the condenser, almost in a state of mere vapour, or within 3 lbs. of a vacuum. The saving of fuel must, therefore, be in proportion, and there must be a very considerable reduction of the actual weight of the machinery, and of the coals on board steam-vessels on long voyages. The paper considered, at great length, the reasonings upon these principles, and in tabular forms gave the comparative results of this and the ordinary engines. The peculiar construction of the compensating engines was illustrated by several models and detailed drawings, showing the peculiar action of the expansion valves, and the two pistons in each cylinder. The great difficulty encountered appeared to have been in the valves of the air-pumps, which were destroyed by the extreme rapidity of the action, this was provided for by constructing an air-pump without valves. By a peculiar arrangement of the air and water passages, it became practicable to substitute for the ordinary cover a piston travelling through a very limited space, and for the air-pump bucket a solid piston travelling the full length of stroke; the valves were thus done away with, and the action of the engine became complete. This construction has been adopted with great success in several stationary and locomotive engines, and is now being applied to marine engines, to which it is peculiarly applicable, as it is of great importance to be enabled to work the Archimedean, or screw, propeller, without the intervention of bands or wheel work.

Mr. J. Woods exhibited and explained the action of Siemens' chromometric governor. The centrifugal governor of Watt being acknowledged to be an imperfect instrument, in consequence of its inability to adjust the valve to the altered circumstances of the load of the engine, Mr. Siemens invented the chromometric governor. The new instrument was stated to have been at work successively for some time at Carpenter's Corn Mills, Shad Thames. It consists chiefly of a heavy pendulum, which is allowed to move to a certain arc of vibration of chromometric revolutions, and it is connected with the horizontal pinion above; which, therefore, moves in union with it. An endless screw is geared in contact with the horizontal pinion, and is drawn by a constant weight in a horizontal direction; it has, therefore, a tendency to produce revolution of the pinion and pendulum. This horizontal screw must be turned by the engine at the exact velocity necessary to insure its running in gear with the pinion, driven at the constant velocity dependent on the length of pendulum; and, should the engine succeed in turning the screw at the proper velocity, no horizontal movement will take place, and the weight on the lever before-mentioned, continues a constant driving power independent of the engine, for overcoming the existence of the atmosphere and the friction of the pendulum. If the load, or the supply of power, varies, a tendency to alter the speed of the horizontal shaft immediately commences, and it takes up a new position, by having travelled faster, or slower, than the pendulum and its pinion, and it retains this altered position; and, consequently, the adjustment of the valve, by means of appropriate connecting levers, until the conditions of equilibrium of load and power are again varied. The action of this governor is so sensitive, that no variation of the speed of an engine—when 40 per cent. of its load is thrown off—can be observed, for the entire change is performed in one-fiftieth of the revolution of the fly-wheel; this change absorbs, or adds, a portion of the momentum of the pendulum, and slightly alters its arc of vibration, the limit of which is between 18 deg. and 21 deg.; and, by the laws of pendulous motion, this is shown to effect the number of revolutions to the amount of only 8 per cent. of its velocity, and even that small variation in the extreme position of the pendulum ceases, immediately the momentum is restored to its former condition.

**STEAM-BOILER EXPLOSIONS—THEIR CAUSE AND MEANS OF PREVENTION.**—We were much gratified to hear, at the Royal Polytechnic Institution, a lecture on the most important discovery since the invention of the steam-engine itself, involving, as it does, life and property of incalculable amount. Dr. Ryan, the learned lecturer, gave it as his opinion that by far the greater number of steam-boiler explosions arise from the incrustation of the boiler, which prevents the boiler from acting efficiently as a conductor of the heat of the fire to the water. Almost all water, whether it be spring or sea water, holds a quantity of bicarbonate of lime in solution. The heat necessary to produce steam drives off one portion of the carbonic acid gas of this bicarbonate, and reduces it to the state of carbonate of lime—an insoluble compound, which is precipitated against the sides of the boiler, forming an incrustation, which becomes a nucleus around which other salts crystallise, which salts would not, however, become crystallised were it not for the presence of this nucleus. It follows, that if the deposition of carbonate of lime could be prevented, the chances of explosion would greatly diminish, if not be prevented altogether. Dr. Ritterbrandt has discovered a cheap, easy, and safe method of entirely preventing the incrustation of steam boilers by chloride of ammonium (the common rock salt ammoniac of commerce), which prevents the formation of the insoluble carbonate of lime. The chloride of ammonium is composed of chlorine, ammonia, and hydrogen, and carbonate of lime, of carbonic acid gas, calcium, and oxygen. The hydrogen of the chloride unites with the oxygen of the carbonate and forms water. The chlorine of the chloride unites with the calcium of the carbonate and forms chloride of calcium, a salt which is, perhaps, one of the most soluble compounds known, and the carbonic acid of the carbonate unites with the ammonia of the chloride, forming carbonate of ammonia, a compound so volatile, that it is drawn off in the shape of vapour, and thus the incrustation is entirely prevented. Both Drs. Ritterbrandt and Ryan deserve great credit, one for so valuable an invention, and the other for the scientific manner in which the lecture was delivered, and the large audience seemed fully to appreciate the value of the invention, by their loud applause throughout the lecture.

**SCREW PROPULSION.**—On Tuesday afternoon, E. Galloway, Esq., delivered a very interesting lecture at the United Service Institution, Middle Scotland-yard, on the different methods of propelling steam-vessels. The room was very fully attended, principally by officers of the army and navy, and several ladies, who appeared to take a great interest in the subject. The lecturer had various diagrams, and some very excellent models of the different vessels that are propelled by the screw in her Majesty's navy. The invention of the screw is one of the most ancient date. Archimedes, from whom it takes its name, wrote very largely on the subject, that it would be the means of propelling vessels, should any other power be discovered to bring it into action—the idea of steam then never having been once contemplated. Pythagoras was also strongly in favour of the screw, but he, like Archimedes, could not discover a force to work it, although the efficacy of it appeared to him certain. The French have taken upon themselves the glory of being the first inventors of the screw, and many works have been written on the subject as early as 1782, and since, in 1804, down to 1825. The system was contemplated by the Minister of Marine during the late war, and a representation was made to Napoleon; but the power of steam not then being known, it was entirely abandoned. The building of steam-vessels in this country having made such a rapid progress, it has been a most important question to the Board of Admiralty, which is the best method of adoption for the Government vessels—the paddle-wheels or the screw? The latter is becoming generally adopted, from the facilities it affords of being shipped or unshipped, as necessity may require; and, in case of an engagement with an enemy, or in boisterous weather, the screw will always have the advantage over the paddle-wheels. The lecturer gave some very excellent illustrations of the screw, and the advantage it has over all other systems for long voyages, and referred to the *Archimedes* steam-frigate, the *Royal Victorias* and *Albert*, and *Rattler*, and several other steam-vessels of the Royal Navy where it has been adopted by Government, and also by the *Great Britain* steamer. In his opinion, he had very little doubt that it will, in a few years hence, be introduced generally. During the lecture there were continual marks of approbation at the explicit manner in which Mr. Galloway delivered his illustrations.

**MAMMOTH LOCOMOTIVE.**—Mr. Norris, the celebrated engineer of Philadelphia, has just finished a locomotive, for the Long Island Railway, which is to carry 800 passengers, and to run ninety-seven miles in rather over two hours.

**THE RAILWAY SYSTEM AND ITS PROJECTOR.**—A recent London *Miner* Journal claims for Thomas Gray the credit of having been, as far back as the year 1818, the great originator of the railway scheme; but, in the year 1812, six years previous, the late Colonel John Stevens, of Hoboken, N.J., laid before Congress a pamphlet, setting forth, in a clear and forcible style, the superiority of railways over canals—not only for travel, but also for transportation of agricultural products and other heavy articles of traffic.—*Philadelphia Courier*.

**SAMBRE AND MEUSE RAILWAY.**—The works on this line have at last commenced, and nearly 1000 men are now busily excavating and cutting the surveyed ground, preparatory to the laying down of the rails, and erecting the necessary stations. The district through which this line will run is one of the most mineral of Belgium, abounding in iron, copper, lead, zinc, coals, &c. Numerous extensive works are in operation, and it may justly be considered the Cornwall or Wales of Belgium. These lines will establish a regular communication with nearly every part of France, Germany, and even Russia, where railway speculations are carried on a large scale.

## THE VACUUM IN ATMOSPHERIC PROPULSION PRODUCED BY THE DIRECT ACTION OF STEAM.

Mr. James Nasmyth, whose indefatigable exertions in carrying out improvements in machinery are so well known and appreciated—whose forge hammer and pile-driving apparatus, worked by the direct action of steam, are making such beneficial changes in the various operations to which they are applied—has just obtained a patent for a novel plan of producing the vacuum necessary in the tube of the atmospheric railway, and here his favourite power, *steam by direct action*, is again brought into requisition. The great objection to the atmospheric system at present is, that in consequence of leakage, &c., a much larger consumption of fuel is necessary to produce an equivalent amount of power, in comparison with the locomotive engine. Much ingenious investigation has been, and is being, exercised, either so to improve the continuous valve as to prevent the admission of air, or to dispense with it altogether, by the introduction of an entirely different principle for the connection of the carriages outside, with the travelling piston inside, the tube; but, whatever success may attend the efforts to mature the several plans which are now before the public, the economy in the production of that power which produces the vacuum is in itself the most important point, in a pecuniary point of view, in the whole system of atmospheric propulsion. By Mr. Nasmyth's invention, it is enabled to dispense with the complex system of stationary engines and air pumps, as at present used—the whole apparatus substituted in their place being a series of two or more large upright air-tight chambers, connected at top by slide valves, and made of boiler plate, to which the steam is admitted from a common low-pressure steam-boiler. The bottoms of these vessels open by suitable valves into the railway main pipe, and also with the open atmosphere, to permit the exit of the air. In order to produce a vacuum, the steam is admitted at the upper end of one vessel, and, as it flows in, does not in the slightest degree mix with the air contained therein, but forces that air out through the valves at bottom, precisely the same as if acted on by a piston, the separation between the two columns of air and steam being perfect. As soon as all the air has escaped, and the vessel, consequently, full of steam, a jet of cold water is thrown into the condenser, which is connected with the chambers at the same moment; the valve is so regulated that the vessel is closed at top, having a vacuum equal to that produced by the best steam-engine, while the connection with the main pipe is opened, and the air rushes into the vessel; in the next vessel the steam is admitted at the top, in like manner with the first, and the alternate production of vacuum and admission of air from the main, goes on with a rapidity and regularity greater than by any steam-engine, as the amount of resistance from friction is absolutely imperceptible, and all that is requisite to cause these two large vessels (or as many more as may be considered requisite) to continue the exhaustion of the main pipe, is, to cause the slide valves at top, and the others at bottom of the apparatus, to work in their several proper positions with regularity.

To render this apparatus perfectly self-acting, the inventor has introduced two small tanks of water placed over the discharge valve, in each of which is placed a small gasometer having a hole in the top, and as the discharged air bubbles up through the water, some of it collects under the gasometer and lifts it up; but, the moment the last bubble of air is gone, and by the action of the valves, steam begins to enter at the top of the other vessel, the gasometer, in consequence of the hole at the top, immediately sinks, causing just at the right time the reverse action of the valve—thus giving the apparatus almost a discriminating power to act at only the proper moment. One very great advantage by this wholesale production of vacuum is also gained, by bringing an entire set of any number of great chambers into the condition of one vast magazine of vacuum; and, on the instant of the signal being given to start, by opening the communication with the main pipe, the train would immediately proceed at a rapid rate on its journey—far more certain and expeditious mode than waiting the effect of air-pumps, with the gradual leakage, and loss of power, until the closing point is reached by the continued exhaustion. Mr. Nasmyth proposes that these vacuum chambers should be lined inside and outside with wood to economise the heat, and prevent loss by radiation, and that they should be inclosed in brick towers, or buildings, which, by diversified architectural design, might be rendered highly ornamental to the various points on the line where they are situated. This discovery is, doubtless, an important one, bids fair to produce a vast change in this yet infant mode of propulsion, and, by greatly economising the production of power, place the system in a more satisfactory light before the public.

**X THE NEW RAILWAYS IN ULSTER.**—We perceive that the 24th inst. has been fixed as the day for a flotation of shares in the Great County Down Railroad, which appears to have met with degrees of favour even greater than might have been anticipated from a project so comprehensible and feasible in itself—and backed by a local proprietary unequalled, for rank, numbers, or influence, in the whole province of Ulster. These noblemen and gentlemen are pledged not merely to support the Great County of Down, but to oppose, by every means in their power, several of the smaller lines lately put forward in that fine fertile county; and hence these schemes have considerably fallen of late in the market, as, with so overwhelming an opposition as that offered by the larger undertaking, their ultimate success is hardly possible. Many of the promoters of this great line are also actively engaged in another new project in the same district, and one of scarcely less importance, as being conducive to the prosperity of the locality it is intended to serve—we mean the "Newry, Armagh, and Londonderry Junction," which, irrespective of its potent claims to the attention of capitalists seeking a permanent investment, has also the rare merit, in these days, of neither being menaced with a fictitious opposition, nor of being liable to a real one, owing to nearly the whole of the local landowners being engaged to assist in it. Among the supporters of both lines are several of the directors of the Newry and Enniskillen Railroad, for which the Act has just been obtained. Important testimony to the utility of the Newry and Enniskillen was borne at the late Armagh Assizes by the county surveyor (Mr. Lindsay), who stated that the line would be a saving of rates to the amount of 30,000. The shareholders in this undertaking are much more fortunate than holders in nearly all other Irish lines, inasmuch as no call will be made for about two months to come, so effectually have the directors husbanded their resources from the original deposits, and so judiciously have they economised their expenses. Had the preliminary matters in other lines been equally well managed, we should have heard little—as yet, at least—of the panic that has affected the Irish market, whereby the Newry and Enniskillen shares have so unjustly suffered a temporary depreciation much below their actual value.

**From a Correspondent.**—We are happy to see that this railway company is progressing as favourably as its best wishers could desire; the application for shares have far exceeded the extent of allotment, which is now fixed to take place on Thursday, the 24th inst. Supplying as this railway will the entire county of Down with complete railway accommodation, and uniting with other important lines, connecting it with all parts of Ireland, it will, doubtless, confer upon this "garden of Ireland," as it was termed in the Land Commissioners' Report, advantages—the extent of which cannot be foretold—and general convenience to the public. The manner in which this project has been met by the landed proprietors of the county—the provisional committee representing more than three-fourths of its entire rental—is the best guarantee of the soundness of the undertaking; that no severe Parliamentary opposition will swell the preliminary charges, and that, in its construction, every economy will be regarded consistent with permanence and security.

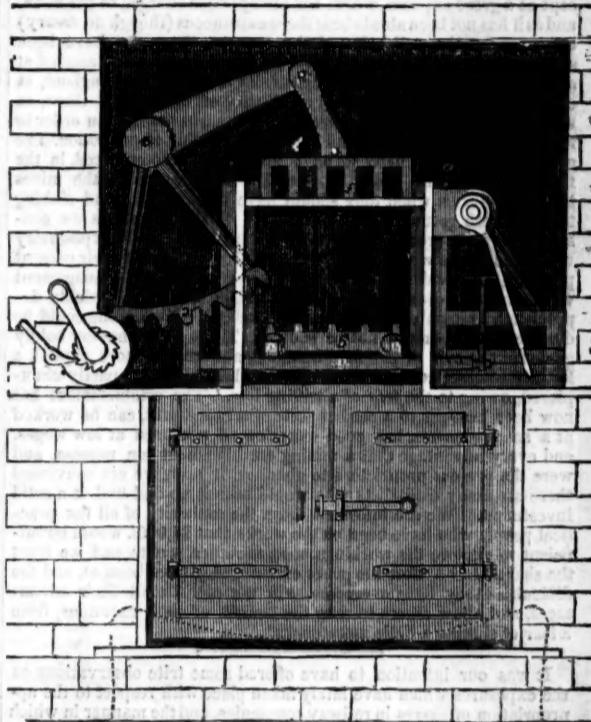
**SHEFFIELD AND MANCHESTER RAILWAY.**—The line between Sheffield and Dunford Bridge was opened on Monday, on the morning of which a large body of the shareholders left the Sheffield station, in a train consisting of about a dozen carriages drawn by two engines, the first of which was driven by Mr. Alfred S. Gee, the resident engineer of the line. One of the carriages contained a band of music, and others were decorated with a number of flags. The hills around the station and the adjoining bridge were covered with great numbers of spectators, who greeted the departure of the train with hearty hurrahs. The occasion was not celebrated by any other demonstration, formal proceedings being deferred to the completion of the Summit Tunnel in September or October next, when the opening of the entire line will be celebrated. On the previous Wednesday the directors went over the line, drawn by one of the new engines made by Sharp Brothers, of Manchester, with its tender, and attached to a commodious coal wagon, borrowed from Messrs. Bradley and Johnson, who are making a quantity for the Manchester and Leeds Company, temporarily fitted up as a passenger carriage, the Midland Company having refused the loan of a carriage for the occasion.

**EFFECT OF NEW RAILWAYS ON THE PRICE OF COALS IN LONDON.**—Mr. Mahon, in giving his evidence before the committee on the Cambridge and Lincoln line of railway, stated that he had had the management of coal mines in Derbyshire for twenty years past; that the coal-fields of Clay Cross, Wingerfield, and Staley, were capable of unlimited supply, and he believed that the Clay Cross and Staley coals were quite equal to the Durham. By the proposed new lines of railway these coals could be delivered in London at 1s. 10d. per ton; Erewash coals as low as 1s. 6d.—while the Wingerworth, which were not so good in quality, could not be delivered in London under 1s. 6d. per ton.

The disputed prices of iron in the Clyde and other districts continue to occupy attention in the metal markets, but much more firmness prevails in Wales, where it is asserted that there is a greater command of the market, in consequence of the quality of the iron being more suited for railway bars.—*Mid. Counties Hbd.*

## COUPLAND'S PATENTED SMOKE CONSUMING FURNACE.

We have this week been favoured with the inspection of Mr. Coupland's furnace for the consumption of smoke and saving of fuel, and, we must confess, that, whatever merits may be possessed by the numerous plans which have been brought forward (and we have seen them nearly all), our opinion is, that Mr. Coupland has achieved what none of them ever achieved before—not the *consumption* of smoke, for there is none to consume, but the complete and thorough oxidation of the fuel, none of it going off in streams of solid carbon, but in those invisible gases the result of perfect combustion—viz., carbonic and sulphurous acids, the vapour of water, &c. The plan by which these desirable results are obtained will be understood by the annexed cut. On proceeding to feed the fire, the grating, *f*, is raised up to the bars, and, by stopping the openings between them, prevents the smallest particle of fuel from falling; by the lever on the left, the number of bars or plates are slid across the furnace over the fire-bars, and beneath the fuel to prevent its falling; the latter, with the grating *f*, then descends, and the fuel necessary being supplied, the bars are raised, and the cross bars withdrawn—the furnace door thus not being opened, perhaps, all day after first lighting the fire. Nothing can be a greater proof of the complete success of this plan, than the simple fact, that as long as the door remains closed not a particle of smoke is to be seen, but open it, and smoke appears, though there nothing like so bad as with a common furnace. The part of the bars which are made to descend are about one-third of the whole bed of the furnace; on each side the bars are fixed as usual. The simplicity of the machinery for performing the necessary operation is another recommendation in favour of this plan; it does not require any power from the engine, but is merely a hand operation, performed with the greatest ease, and the machinery is quite away from the action of the fire.



The following experiment shows the advantages in the evaporating power of this furnace, and the saving of fuel, in addition to that of producing no smoke:—9 cwt. of coal, at 24s. per ton, evaporated by a furnace on the old plan 558 gallons of water; by the new 670—showing a balance in favour of the latter of 112 gallons, or about 20 per cent. Screenings, at 12s. per ton, were next employed, to ascertain what fuel was best suited to the new plan, when 18s. worth gave the same results as 24s. worth of best coal. We cannot help thinking, if a commission is appointed by Parliament to ascertain and report on the best smoke-consuming (as it is termed) furnace, that the one under notice must be successful.

**BIRMINGHAM AND GLOUCESTER RAILWAY COMPANY.**—A special general meeting of proprietors was held at the offices of the company, Birmingham, on Thursday, the 17th inst., for the purpose of considering a bill now before Parliament, to enable the company to make extension lines at Gloucester, a branch at Stoke Prior, and a junction with the Midland Railway at Aston-juxta-Birmingham.—Mr. S. Bowley (chairman of the board of directors) in the chair.—The SOLICITOR having read the marginal notes of the bill, the CHAIRMAN said, this was a bill in which the Birmingham and Gloucester Company were only indirectly interested.—Mr. HOMER understood the bill had been read a third time in the House of Commons, and wished to know in what stage it was in the Lords.—The SOLICITOR: It will go before the Standing Orders Committee to-morrow.—The CHAIRMAN, in reply to a proprietor, said, the expenses will be borne by the Midland Company, the Gloucester Company having only an indirect interest in the bill; the dividend had been compromised with the Midland Company; it was to be committed for 26,000*l.* There was a little question between the two companies—the Birmingham and Gloucester Company, and the Bristol and Gloucester Company—but it was a very small matter. The dividend would be something like 1*l.* 17*s.* 6*d.* per share.—A DIRECTOR: That is up to the 1st of August. The dividend will be then 3 per cent. for the half-year. We may say that the dividend to the 1st of July will not be less than 1*l.* 17*s.* 6*d.* per share, and not more than 2*l.*—The meeting then separated, the proceedings having lasted about seven minutes.

**WEXFORD, WATERFORD, AND VALENTIA RAILWAY.**—The allotment of the shares for the construction of this line having been made, we are glad to see that the managing committee are following up the preliminary measures by such spirited and active exertions as will secure the best line to the public, and the greatest amount of return to the shareholders. Their engineer, Mr. Gravatt, has just made his report to the directors, by which he shows an almost total absence of engineering difficulties, and that with a double line of rails the cost will not exceed 800*l.* per mile. We look upon this as one of the most important railways in Ireland—it will completely intersect the country in its very centre, and in a distance of 13*1*/<sub>2</sub> miles, connect the two coasts at the very best points of communication between England and America—Wexford on the east, and Valentia on the west, besides opening a valuable line of traffic through a rich and densely-populated country—thus leading the way for a speedy transit to the English markets, and a development of those mineral and agricultural resources which are so prolifically scattered throughout this railway's course, in the interior and west of Ireland.

**DEMAND FOR LABOUR.**—Not less than 150 strong able men have left the immediate neighbourhood of St. Helens, in Lancashire, to seek employment on the French railways; from the scarcity of hands, wages are rising, and agricultural labourers now obtain 14*s.* per week.

**GIGANTIC FOSSIL REMAINS.**—The *Mobile Advertiser* states that Dr. Koch (a gentleman who has devoted so much time to researches in fossil geology) has lately discovered, in the state of Alabama, in a yellowish limestone formation, the remains of an enormous animal of the saurian tribe, which puts everything yet found in the shade; he has succeeded in bringing to light nearly the complete skeleton of this terrible monster, which he terms "the king of reptiles." It is said to be 104*f.* in length, each vertebral bone is from 14*i.* to 18*i.* long, by 8*i.* to 12*i.* in diameter, and weighs, on the average, 75*lb.*; its jaws are of enormous length, containing forty incisors (or cutting teeth), four fangs, and eight molars (or grinders); the teeth in the upper and lower jaws lock together when the mouth is closed, evidencing that the animal was carnivorous; the eyes were very large, and prominently situated, enabling it to keep a vigorous watch for prey; its paddles or fins are small in proportion to its size, made up of twenty-one bones, forming seven freely articulating joints; the ribs are three times in thickness at the lower than they are at the upper extremities, and much more numerous than in other species. This reptile is very considerably larger than any yet discovered, not excepting even the famed Missouri, which, we believe, was also discovered by Koch.—We should recommend Dr. Koch either to secret the remains of this monster, or keep his own counsel—otherwise, should "Antemegalathirum" discover it, we expect that he will play Don Quixote with this creature, which, coming so soon to light after others of his species had been denounced, show an impudence only commensurate with its size; the impudence of the animals of the boniferous era is really astonishing.

## THE MINING JOURNAL,

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Railway and Commercial Gazette.

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**LONDON, JULY 19, 1845.**

Our readers will observe, by the report in another part of our paper, that the Alten Mining Association, which was threatened with a dissolution, has had the evil averted for some time—the meeting having adjourned for three months, in order that a provisional committee might be formed, either to sell the works, or create fresh capital. Some portion of the shareholders present at the meeting did not appear very sanguine as to the results; but when we consider these works were established in the year 1826—have subsisted from that period till the present time, through good and evil report—and have returned in produce more than 200,000*l.*, and that dividends have been declared, we think that they should not be abandoned without a struggle. These works, situated within a short distance of the North Cape, at the most northerly part of Europe, under a climate which has nine months' snow, have had almost incredible difficulties to contend with. When first discovered in the year 1826 there was not an inhabitant on the spot; the proprietors had to bring people from England and the southern parts of Norway, at high wages—to build houses for them—to make roads, &c.; in short, entirely to colonise the locality. This could not be done except at a great expense, which has always been charged to the mine, and as it has not been able to bear these extraneous (though necessary) expenses for the well-being of the concern, the works have been stigmatised as bad. Smelting-works were subsequently erected at a vast cost; smelters were brought from Germany and England, at expensive salaries; not having a quantity of fusible ores there, as at other places, costly experiments were put in practice, in order to find out the proper fluxes and bring the smelting to perfection. The great error appears here to have been having commenced, in the first instance, with much too small a capital, stopping the mines to make returns, when they should have been driving and sinking to open fresh ground. The declaration of the dividends we consider, likewise, premature, as had they been laid out in exploratory work, the mines would not at this period have been in their present position. A dividend having once been declared, the management were forced, in order that the shares might not be too quickly depreciated, to keep the mines to that pitch, that if no profit could be declared, a loss should not be shown. Through not having boldly grappled the evil in the first instance, and raising more capital, a locality intersected with mineral veins has been left partly unexplored, owing to the fear of a trifling loss. The establishment has now been brought to a perfect state of arrangement, can be worked at a small expense, has good experienced workmen at low wages, and every advantage that a mining establishment can possess, and were the present proprietors to abandon it now, we are convinced there are many capitalists who would take it up and find it a solid investment. We are informed, from the authority of all the practical people who have been on the works, that 25,000*l.* would be sufficient to explore the workings, so as to return profits, and we trust the shareholders, after the great expense they have been at, and the difficulties they have overcome, will not sacrifice all their advantages, and allow others to reap the benefit of their exertions, from a fear of sinking a little more capital.

It was our intention to have offered some trite observations on the exposures which have lately taken place with respect to the appropriation of shares in railway companies, and the manner in which interest and patronage are secured; but, as some inquiries are still going on, which may involve many parties, whose position in society has, heretofore, been deemed sufficient to disarm suspicion, we abstain from entering on the subject so much in detail as we should, otherwise, feel it to be our duty to do. Yet, we cannot allow the late inquiry, involving the probity and character of Mr. HIGNETT, the solicitor to the Board of Trade, and two of the Lord's Commissioners, who indirectly, it may be supposed, possessed some power and interest in the passing of the measure, to pass by quite unnoticed. In this case, there were rival lines, and the solicitor to the Board at least held out to the projectors and supporters of the one, the prospect of aid at head quarters; the consequence of which was, the appropriation of certain shares, which, being sold in the market, yielded a premium, and thus gave the *quid pro quo*. We are well aware that, at a time when it is only necessary to obtain an appropriation, in most cases, to insure a premium, many a *ruse* is resorted to with the view of securing shares, and, we have no hesitation in saying, gross deception and fraud is often practised to attain this object. The mere "writing for shares," is a complete farce; many are there, who, without a habitation, or a name—at least, such as they would attach to their application—are to be found amongst the list of applicants with false signatures and address. Why, we would ask, is it, that an example is not made of one or other? We believe, however, that the matter is of too general a nature, and being so universal, single instances are allowed to escape notice. We have been given to understand that the subject will be brought under the notice of Parliament. We shall see.

We referred to the important subject of the manner in which salt is admitted into British India in the last Number of the **MINING JOURNAL**, and again make a few remarks on what we consider a very restrictive monopoly exercised by the authorities of the Hon. East India Company over the introduction of this necessary article into the presidencies of Bengal and Madras. All monopolies are detrimental, to the welfare and prosperity of a nation, and her commercial intercourse with other countries. That the manufacture of salt in the above presidencies, is a most lucrative speculation to the Government there can be but little doubt, as the consumption of the presidency of Bengal alone is estimated at upwards of 250,000 tons annually; and that of Madras, from 95,000 to 100,000 tons; and Calcutta transmits into the interior to a considerable amount, although the salt there is generally of an inferior quality compared with the other, or that imported from England. The tax levied upon this article is most onerous, and its high price is the theme of general complaint among all classes of her Majesty's loyal subjects in that extensive portion of the British empire, military as well as civilians—while the company are accruing the advantages unmolested by the Government at home. A change in this system must speedily take place, by the introduction of railway communication now on the point of being adopted generally in the different presidencies and the interior; as the adulteration of salt is a most profitable speculation to hundreds, who evade the officers of the company, and send it by stealth to nearly every part of the empire. The time is fast approaching when the monopolists of the east must make a great change in their tariff restrictions on British goods in general, and particularly the interests of the white salt proprietors of Cheshire, Worcestershire, Lancashire, and Derbyshire, call for it loudly, if they wish to prevent the smuggling that is carried on to an alarming extent by the Dutch, Portuguese, French, and Americans, not only in cotton and silk manufactures, but salt in particular. By admitting this necessary article at a moderate duty, it will not only enable the natives to purchase it in a pure state, but put an end to the peculation now carried on in nearly every part of the country, notwithstanding the vigilance exercised by the *employés*. The trade in this commodity with China is rapidly on the increase; and let the company consider well the importance of the subject before it is too late, and act with justice towards their own countrymen before it is wrested from them by

foreigners. The restrictions under which the white salt proprietors of England are labouring from the Indian authorities, have attracted the earnest attention of the Board of Trade, and also the Board of Control, who are most anxious to render every facility to promote the interests of the British salt trade in any of the new commercial treaties with foreign countries. In France, there is a monopoly over salt, tobacco, and snuff, by the Government—the same in Portugal and Spain; but this exaction is evaded by smuggling, and they have found it more beneficial to the revenue to allow the importation of these articles at a moderate fixed duty, so as to prevent the illicit traffic from Belgium and Holland, and in Spain and Portugal, from Gibraltar, where there is annually to a very large amount imported by the English and American shipping that visit that port. For the present, let the salt manufacturers wait with patience till the return of the answer to the memorial that has been sent out to India by the board of directors, as promised in their letter of the 2d ult. to the committee of the white salt proprietors of England; and, let us hope, that the impediments now existing to that branch of English industry will be partially removed, by reducing the duties, and the restrictions that now prohibit a free commerce of that article to our Indian possessions.

We have received several communications on subject of the prices of mine shares, more especially directing to those obtained for shares in Wheal Maria—700*l.* being the quoted price for a 102*st* share. This mine is certainly one of the most extraordinary discoveries ever made in Cornish mining. True it is that we have heard of the Ecton Mine, and have seen the immense results arising from the Mona and Parys Mines in Anglesey, and other districts have yielded vast returns. The Consolidated Mines, with their numerous lodes, have yielded largely; the Tresavean, the Carn Brea of late days, and the Wheal Alfred, the Wheal Vor, the Dolcoath, and Cook's Kitchen district, and numerous other mines, which we might mention, afford full evidence of the richness of the deposits; and many of the Cornish lodes, which have been worked perseveringly to a great depth, and to a considerable extent on their run, afford conclusive evidence of the value to be attached to mines in particular localities, and to lead us to believe no returns too incredible which the mind may contemplate. In looking at Wheal Maria, it is, however, to be observed, that she is only in her infancy—being some thirty fathoms deep and seventy fathoms long, so far as the ore ground has been developed. This discovery, if we are to judge by the market price of shares, exceeds all that had preceded it; and, it is our duty, without the slightest desire to militate in the least degree against the interests of the shareholders, or to cast a damp on the bright prospects which present themselves, calmly, but firmly, to canvass the security upon which transactions of such a magnitude, and at prices which appear to us so excessive, are effected, and while there is yet time to warn the public of the consequences which must attend any deterioration in the mine, or a falling off of produce. It must be apparent to all who will give the subject one moment's reflection, that, if holders in mines at these excessive prices are not "let down" easily, the mining interest altogether suffers. Speculators become more than ordinarily cautious, suspicion is engendered, and things deserving of outlay and encouragement are, consequently, neglected, injured, or destroyed. Suppose that we make a calculation, by way of exemplification, of our views. The Wheal Maria lode is said to yield 20 tons to a fathom, worth 10*l.* per ton, or 200*l.* to the fathom. We will say take the lode as bearing ground to this extent for 100 fathoms long—this would give us 20,000*l.*; by saying fifty fathoms deep, this would amount to a million of money; and, taking one-half as net profit, we should have a surplus of 500,000*l.* divisible among the adventurers. If that this quantity of ground *had been* laid open, and the data we have here assumed once satisfactorily ascertained, we should have no difficulty in arriving at a conclusion as to the advantages which the mine presents, and should, accordingly, feel no hesitation in offering an opinion; but, until this is effected, we must say, we feel somewhat scrupulous on this point: our present object being only to direct attention to a point, which, we apprehend, is too much loss sight of. In calling attention to this mine, it is possible our remarks may provoke commentary on the part of those interested, who naturally consider that "the value of a thing is just so much as it will bring;" and, we can only say, that it will afford us much pleasure in recording evidence which will establish the value of the shares at the price now attached to them; but, being strongly convinced, not only of the importance of the point at issue, but the soundness of our views, we have no hesitation in calling the serious attention of our readers to the subject. We offer our remarks in sober seriousness, and words of cantion are, at times, as valuable as gold. There are two questions to which, then, we invite attention.—1st, What will the adventurers in Wheal Maria say in two years if we are wrong? 2d, How will the proprietors of Wheal Maria look in two years if we are right? In conclusion, we beg to repeat that the preceding remarks may be considered to apply generally to mining, and we recommend in all cases that the number of shares should be multiplied by the price.

It was our intention to have rendered an abstract of the proceedings in the law courts in Dublin as affects the doings of the Talacre Coal and Iron Company, and certain of the parties connected with that project having at some pains obtained the notes of evidence, and the charge of the learned judge, to which it was our intention to have appended a review of the several causes brought into our courts of law (six in number) bearing on the subject. The continued demand on our columns, however, precludes us from affording the space required for doing full justice to the subject, and hence we must defer its insertion. We should not have adverted to the matter here, but, having received more than one communication, the insertion of which we must decline, as the object is too apparent, it is meet that our correspondents should understand the subject has not escaped our notice, nor are we otherwise than well informed as to the movement in the City.

**EXHIBITION OF MINERAL PRODUCTIONS AT BERLIN.**—The annual exhibition was held at Berlin, and attracted the attention of all those interested in mining speculations. The forging of iron has made the most rapid progress within the last few years throughout Germany. The royal foundry of Berlin was the first, now thirty years ago, to give an impulse to this industry, since which period it has abandoned the casting of fine metals for articles of fancy, and now confines itself to casting of large sheets, for machinery and building, in which they pay particular attention. They employ either new iron, imported from England or Silesia, or recast the old in amalgamating it with finer sorts; the sand used is procured in the vicinity of Berlin, and a red sand imported from England. In general the price of cast-iron of fine quality is the same as it is in France, from 1*l.* 3*s.* to 1*l.* 5*s.* the 100 kilos. (2 cwt.) The bars of iron presented at the exhibition, manufactured by wood or coal fuel, were of an excellent quality, well worked, and not inferior to those of England. The price of Silesian iron, worked with wood, was for ordinary size, 1*l.* 10*s.* the 2 cwt.; rods or bands, 1*l.* 15*s.*; small sized, 1*l.* 12*s.* to 1*l.* 18*s.*; that worked with coal, 1*l.* 5*s.* to 1*l.* 10*s.* In the Hartz the common iron, with wood, is sold at 1*l.* 12*s.* On the Rhine and Westphalia common iron, with wood, is sold at 1*l.* 10*s.* to 1*l.* 15*s.* that by coal at 1*l.* 5*s.* to 1*l.* 10*s.* per 2 cwt. In Bavaria, iron varies from 1*l.* 10*s.* to 2*l.* 2*s.*; in Thuringia, from 1*l.* 18*s.* to 2*l.* In Belgium, the prices vary greatly from the above—viz., common at 1*l.*; ditto, for rails, twice refined, 1*l.* 0*s.* 6*d.*; first quality, three times refined, 1*l.* 2*s.* 6*d.*; and for superior qualities, 1*l.* 10*s.* the 2 cwt. The English irons which are imported into the Zollverein are composed of 5 per cent. of Welsh iron, 30 ditto Yorkshire, and 65 ditto of Staffordshire. At present they are obliged to import their supplies from abroad (England or Belgium); but, as some extensive speculations in mining operations are about taking place, there is little doubt they will soon be able to manufacture sufficient for their own consumption.

**THE IRON-TRADE.**—The meeting of the ironmasters for the purpose of transacting the usual quarterly business of the Dudley district was held at the hotel on Saturday last, and was numerously attended; the principal business, of course, being to confirm the prices agreed upon at the Birmingham meeting on the Thursday previous. We have before observed that, although during the past quarter, the nominal price for bar-iron has been 10*l.* and upwards per ton, yet, that numerous transactions had taken place at a considerably less figure—some houses having gone down to 8*l.* per ton, particularly towards the end of that period—indeed, so uncertain have been the results of any decisions come to, that a price fixed one week has been departed from the next. From the appearances of the market, and the general aspect of the iron-trade, the meeting of Saturday came to the resolution of confirming the prices recommended at the previous meetings during the week, and a reduction of 2*l.* is the consequence: the prices declared being, at the works—bar-iron, 8*l.*; pig, from 3*l.* 10*s.* to 4*l.* per ton. How long these prices will remain steadfast, is to be seen; for, although there is at present no prospect of any unusually large orders at home, it is not unlikely that this sudden declaration of a fall may cause a brisk foreign demand; but, as fluctuations in prices have been the cause of all the embarrassments which the trade has hitherto suffered, it is to be hoped, the most influential of the masters will endeavour, by all the means in their power, to keep the trade to this price during the quarter, more particularly as it is known and acknowledged to be a remunerating one. The workmen in South Staffordshire are in a very unsettled state; strikes take place almost daily without any benefit to the men, and they generally return to their work in a sadly worse condition than they left it. Many of the padjlers who are out, it is stated, are engaged by some of the American houses.

**NEW METHOD OF PRODUCING IRON.**—The American papers inform us that a Mr. Green, of New Jersey, has made a most important improvement in the manufacture of iron; by this method, instead of using all pig-iron in the process of puddling, which costs \$35 per ton, he employs a large portion of ore, which costs only \$25 per ton, with a portion of pig-iron—effecting a saving in labour and material of 33 per cent., besides producing a better quality of iron. The process by which these advantages are obtained, is evidently a modification of Mr. Clay's patent for the production of iron direct from the ore by the use of anthracite, and is as follows:—six tons of pulverised iron ore are mixed with two tons of anthracite coal dust, and the whole poured in at the top of a reverberatory furnace upon the slag bed below; it is then to be worked into a loose granulated mass, and pushed to the furthest end of the hearth: four tons of cast pig-iron are then to be introduced, and, when at a white heat, it is to be heaped on the already half fused ore, and worked up into balls, to be treated in the same way as if the whole were pig metal. It is expected the process will enable every furnace to double its make, and, of course, to render the metal much cheaper.

**COAL AND IRON MINES OF FRANCE AND BELGIUM.**—The rapid progress that has been making of late years in France and Belgium, in railways and steam navigation, has opened a vast resource to mining operations. Hitherto these countries, although abounding in iron, lead, and other metallic riches, with extensive fields of coal mines, imported the greater portion of their supplies from the north of England and Wales, partly from a want of proper machinery to work them, and, secondly, the difficulty and expense of transporting the produce of the mines to Paris, and the most advantageous markets in the manufacturing districts of Rouen, St. Quentin, Elbeuf, Louvier, Sedan, Lyons, &c., where, by the emigration of some of the best workmen from Manchester, Leeds, Sheffield, Birmingham, Nottingham, Norwich, and other towns of England, as well as Glasgow, cotton and woollen manufactures, iron, &c., worked by them, and English made machinery, have sprung up in every direction, initiating the natives into the use of what they formerly looked upon as a chimera or impossibility. The number of English families that have taken up their residence, since the peace, both in France and Belgium (where wood and turf were the chief fuel), has been the means of causing researches to have been made for coal in various districts; this, added to the impetus given of late years by the French Government in the building of steam vessels, so as to compete, in a measure, with the progress making in steam navigation in the United Kingdom, has opened a vast field for excavating this rich resource to the mining interest. The great demand that is likely to be made for some years hence for both wrought and cast-iron in France and Belgium, for the railways now in progress or projected, has given a speculative turn to the holders of iron mines that never could have been foreseen twenty years ago. Steam machines are now at work in all the mineral departments or districts that were formerly looked upon as barren or nearly worthless, as the speculators in railways find that they must not only make the rails and machinery in the country, but also procure the means to do so from the hidden resources in the earth. This is, in a great measure, to be attributed to the extensive railway operations going forward from one end of Great Britain to the other, causing that demand for iron that it has nearly doubled in value within the last two or three years, so as to preclude it being exported to the continental markets, which must depend upon their own natural industry and mining powers. The departments most fertile in coal are the Meurthe, Sambre and Meuse, Marne, Haute Marne, Moselle, the Rhine and North, in which iron also abounds, and also throughout Belgium, where very extensive works are at present in operation, chiefly under the direction of Englishmen. The late treaty between the latter country and the Zolverein, or monopolising powers of Prussia and Germany, which have materially reduced the *Belgian produce will be the cause of a rise in the value of iron*

on duties on Belgian produce, will be the means of causing a surprising demand, both for coals and iron, for the railways now in progress.

**IRON TRADE.**—The iron-works in Merthyr Tydvil, and neighbouring districts, are carried on most vigorously—many having no rest, even on Sundays; later is also very plentiful this year—quite different to what it was this time last year. The price of iron is not so high as it was two or three months ago, yet, if it will continue as at present, masters and men may do well. Such has been the influx of strangers to all the iron-works, that cottages are become very scarce, and many are being built in every direction.—*Liverpool Mercury.*

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**COAL MARKET, LONDON.**  
MONDAY.—Price of coals per ton at the close of the market:—Adair's Main 13 6—West Hartley 14—Baddie's West Hartley 15—Carr's Hartley 15—Davidson's West Hartley 15—Hastings' Hartley 14—Holywell Main 15—Nelson's West Hartley 14 6—Percy Hartley 14—New Tanfield 14—Original Tanfield 13 6—Old Pontop 13—Ord's Elburgh 13—Pontop Windsor 13 6—Ravenworth's West Hartley 14—Stormont Main 14—Taylor's West Hartley 14 6—Tunfield Moor 16—Tunley 14—West Hartley 14 6—West Wylam 14 9—Wylam 14 to 14 3—Wall's End Bewicke and Co. 15—Bell Robson 14—Gibson 15 6—Goatforth 15—Hotspur 14 3—Killingworth 14 3—Riddell's 14 9—Walker 9—Wharncliffe 14 9—Eden Main 15 6—Belmont 16 5—Braddly's Hetton 17—East Marion 18—Haswell 17 2—Hettion 17—Lambton 16 9—North Hetton Lyons 15 6—Pembridge 14 9—Russell's Hetton 16 3—Shotton 16 9—Stewart's 17—Harlepool 17—Heugh 15 6—Kelloe 15 3—Trindon 16 6—Adelaide 16—Adelaide Ties 16 6—Barrett 14 6—Barrington Ties 14—Brown's Deaneary 14—Hartpole 14 3 to 15—West Hartley Newton 14 6—Fox 14 6—Gordon 14—Seymour Ties 15 6—South Durham 15—Tees 16 6—West Ties 14 6—Cowden Hartley 15—Derwentwater Hartley 13 6—Hartley 14—Llan-

## MINERAL WEALTH OF NOVA SCOTIA—No. III.

BY A. GERNER, ESQ., F.G.S.

The application of steam to navigation has placed the British colonies in a new light, and in none of them will its future advantages produce more beneficial results than in the North American Provinces. It is a fact of great importance to Britain that she possesses abundant stores of coal on both sides of the Atlantic Ocean, whereby she will always be able to maintain her steam navigation to the western world. The coal of Nova Scotia alone is sufficient to supply the British steam navy for many centuries, and also amply meet the demands of all the North American colonies. Indented with numerous bays and excellent harbours, with coasts abounding in fish, and with a climate and soil highly favourable to agriculture, forests for the supply of timber, and inexhaustible deposits of minerals, Nova Scotia, is destined to be of inestimable advantage to the mother country; but, before the province can rise to a level with her natural wealth, the monopoly of the General Mining Association must be removed, her resources must be opened to free approach and competition, and general improvements must be introduced. If the British Parliament and people complained of the monopoly of the sulphur trade by foreigners, surely the people of Nova Scotia have reason to complain of the monopoly, not only of their coal but of all the minerals of their country, by a British company, who have long since forfeited any claim they may have had to those minerals; and who themselves refuse to improve, or allow others to enjoy, the common bounties of Providence. But before a careful inquiry is made into the claims of that body to the minerals of Nova Scotia, and their mode of evading the payment of the royalty thereon, it is necessary to give a brief account of the coal-field and chief mineral deposits of the country, so far as present discoveries will allow.

Whether the productive coal measures of Nova Scotia are all contained in one continuous coal-field, or are situated in separate troughs, or basins, is a point which has not yet been satisfactorily established. No general survey of the mineral deposits has ever been made, and the imperfect knowledge acquired of them is derived from the unaided labours of a few individuals, who have made limited examinations for scientific purposes. If any discoveries have been won by the General Mining Association, they have been carefully concealed; for to disclose to the people the situation of any valuable mine, and then prevent them from participating in its advantages, would be as ungenerous as their present monopoly is unjust. It is not presumed, however, that any considerable number of the individuals who compose that body would tolerate acts of oppression, maintain an unjust claim, or seek to evade the payment of the established royalty; but it is evident that they have been misled by those in whom they have confided, and were the General Mining Association of London fully acquainted with all the transactions of their representatives, it is not probable that they would be any better satisfied than the people of the province, who blame the mass for the defects of its individual elements.

For descriptive purposes the coal region of Nova Scotia may be noticed in separate divisions, although it is not improbable that all the coal is contained in one large field of very irregular form. The coal district reaches from Chignecto Bay, in the county of Cumberland, along the north side of the province, to Northumberland Straits, and thence to the Gut of Canso. From observations recently made by the writer, it appears that there is a coal tract extending from Windsor, Falmouth, and Horton, along the south of the Basin of Mines, across the Shubenacadia, through the northern side of Musquodoboit, to the eastern shores of the province, thence crossing the Strait of Canso the same tract embraces part of the island of Cape Breton, where coal is abundant. The writer has explored the whole of the great coal-field of New Brunswick during the geological survey of that province, and found that it occupied an area of no less than 8000 square miles!!! The productive coal measures in that province appear most frequently in the interior of the country, while those of Nova Scotia occur on the shores of her bays and rivers, where they offer every advantage for mining operations. The New Brunswick and Nova Scotia coal-fields are united at the divisional line between the two provinces, and belong to one carboniferous period. The sandstones, shales, limestones, and occasionally thin seams of coal, with vegetable remains, are at Horton, the most westerly extremity of the southern arm of the coal district; the same and similar strata appear at Falmouth, Windsor, Rawdon, Douglas, and on the banks of the Shubenacadia River; they also skirt both sides of the Basin of Mines, and appear at Gay's River, Musquodoboit, and in the uncleared country eastward. The eastern shores of Nova Scotia consist of strata belonging to the coal series. Strata of coal have been accidentally discovered near the River Philip, on the Tatmagouche road, at Onslow, Londonderry, and Parrsborough. Almost the whole area of the county of Cumberland is a coal-field. At Springhill, in Maccan, there are several strata of coal, one of them is ten feet in thickness, and the coal is of a superior quality. Productive coal measures are also seen near the Maccan River and the River Hebert. On the southern side of Chignecto Bay the sea has worn away the shore, and presented to the geologist a beautiful section of the coal-field, which extends along the side of the bay to the distance of forty-five miles. The cliffs are perpendicular, and will average from 150 to 200 feet in height. During the recess of the tide, each stratum may be examined by travelling along the shore, which at many places is strewn with masses of coal, clay-ironstone, and fragments of fossil trees.

At the South Joggins, nineteen beds of coal have been discovered; a number of them may be seen extending from their outcrops at the top of the cliff, downwards beneath the sea; the total thickness of the productive group at this place is about 1600 yards. Between the coal strata there are fossil trees of enormous size, standing perpendicular to the layers of rock, which dip to the south at an angle of 23 deg. The coal strata are from a few inches to five feet in thickness, and five of them may be advantageously worked upon the shore of the fine navigable bay.

The coal-field in the county of Pictou occupies an extensive trough or basin; the outcrop of the coal reaches along the country to the distance of four miles, and has been opened at the Albion Mines, near New Glasgow, by the General Mining Association, who ship from that place to the United States from 30,000 to 50,000 tons of coal annually, besides supplying a number of the provincial towns and villages. Ten valuable strata of coal have been penetrated by the workings at the Albion Mines; the united thickness of the beds of coal is upwards of seventy-five feet; the main coal band is no less than thirty-six feet in thickness—of this the company only work twelve feet, leaving twelve feet of good coal, and twelve feet fit for furnaces and forges. In 1839, six steam-engines, 100 horses, and 500 men were employed at those mines, and 48,000 tons of coal were exported to the United States, and different ports along the coast.

There are a number of situations in the vicinity of New Glasgow, where the coal might be advantageously worked; but, although the association have no title to that valuable mining district, they have effectually prevented other persons from sinking shafts—having confined their own operations to the Albion Works, the only mines they have ever opened in Nova Scotia Proper. There is also an extensive coal-field in Cape Breton, and the company, under an assumed claim, raise great quantities of coal at Spanish River, in that island. As the monopoly has prevented every kind of mining enterprise in the province, no survey or general exploration has ever been made of the coal-fields and other mineral districts, and the Legislature and people of the province had viewed the pretended claims of the association with indifference, until the price of coal became alarming, and the payment of the royalty, which forms the chief part of the casual revenue of Nova Scotia, was evaded. They have since grown, in some degree, alive to their interest and their rights; the claims of the company to the mines and minerals of the whole colony have been proved to be unfounded, and redress has been sought for at the foot of the Throne. The province contains about 15,000 square miles; of that area there are, according to an estimate made from private explorations, 2000 square miles of coal-field. The coal-field of Pictou will supply 100,000 chaldrons of coal for 1000 years, and Cumberland and Cape Breton will each, probably, afford the same quantity for the same length of time. Besides the deposits referred to in this estimate, there are others of which little is known, but, nevertheless, they afford evidence of the inexhaustible stores of the bituminous mineral contained in the colony.

On the coast of Chignecto Bay the tides rise upwards of fifty feet, at low water the beds of coal are uncovered by the sea. Upon these beds vessels from New Brunswick and the United States lie aground, and receive their cargoes, and as the shore can scarcely be said to be inhabited, no notice is taken of such depredations. From the situation of this coal upon the side of a navigable sheet of water, its proximity to the American and other markets, and the comparatively trifling expense that would attend the opening of mines, it is surprising that the coal should so long have been sealed up against the hand of industry, and the actual wants of the country. Petitions have been frequently presented to the Government, in order to redeem a part of the Cumberland coal-field, but the influence of the

association has hitherto rendered every attempt to improve the mineral resources of the country abortive. Having expended a large amount of capital in the eastern parts of Nova Scotia, they have no desire to work the mines of Cumberland, on the west, fearing that the trade from Pictou and Cape Breton would suffer from the exports made from Chignecto Bay—and thus a great source of revenue to the province, and profit to its inhabitants, has been shut up by the cupidity and selfishness of a few individuals. The steamboats that run into the bay are propelled by coal imported from Great Britain: their keels often pass within a few feet of the coal strata already mentioned, and from which they might be cheaply supplied; but the inhabitants of Nova Scotia have not been permitted to open the earth beyond the depth of the soil, and up to the present hour they are compelled to pay the price fixed by a single company for all the coal they consume. By withholding the coal from the inhabitants of any civilised country, where that mineral is found, the manufacture of iron and other metals is prevented, manufactory cannot exist, trade will languish, and general industry be greatly retarded. The truth of these remarks is fully proved by the present state of the province—a colony that will never thrive until her resources are liberated from the fetters of unyielding monopolists.

THE GOLD MINES OF SIBERIA.—The mineral riches of this vast empire of the north of Europe are but partially known to the more civilised portion of the continental population. The autocrat Nicholas is one of the largest holders of mines, particularly gold and silver, and is justly considered the richest monarch of the mineral kingdom. Russia, extending as it does from the northern to the southern poles, possesses more valuable mineral productions than any other portion of Europe; and all that is now wanting is, the introduction of machinery to work its valuable ores. The late Emperor Alexander did more to civilise this country than any of his predecessors: he gave every encouragement to the arts and sciences, by inviting to St. Petersburg some of the most scientific men of the day; and his brother Nicholas has pursued the same praiseworthy course: so that in less than another quarter of a century, a wonderful change will take place in this comparatively unknown portion of the globe. The gold mines of Siberia have, within the last few years, attracted the special attention of the Government, as they have increased in return in a most astonishing manner. They were at first worked by private individuals; shortly after, however, some extensive companies formed, in the mountains of Altai, a mining exploration on a large scale, which soon realised a very remunerating profit. The attention of the Imperial Government was roused by these rapid successes; and, to prevent the confusion, or depreciation, such working might produce in the mineral market, the concessions were subjected to more restrictions than formerly. Up to the year 1842, the working of these mines were granted in perpetuity, under the condition of an annual tax of 15 per cent. on their produce. After this, an ukase restricted the term to twelve years, which is not sufficient time to work the mine to advantage; after which period, it is to become the property of the state. A tribute of 20 to 30 per cent. is, besides the above, exacted, on the licensees; notwithstanding which, however, the working continues to give a very considerable profit. According to the official returns made in 1843, the mines of Siberia returned 40,000 lbs. of gold—being worth about 2,850,000L. It is expected that, in a very short time, the annual production will be on an average 8,000,000L. sterling. This is only on a small calculation, as the working population is not barely sufficient for the work required; as, during what is called a campaign, the number of days they labour does not exceed ninety, and that under the most vexatious tyranny of those over them. Coal seams are in abundance throughout the whole of Siberia, and, in fact, all over the Russian empire; and all that is wanting is, the introduction of English machinery to work them, and then the rich gold mines, by the aid of steam power, will increase in a most rapid manner in yielding their hidden treasure, when, no doubt, the Government will issue further restrictions and exactions towards the speculators. The Emperor has, hitherto, had very few mines worked on his own account; but, he is the absolute possessor of most extensive tracts, of what are reported to be extremely rich in mineral, and will be the most productive; and, from assays made by some of the most scientific mining engineers of Russia, England, France, and Germany, they are represented to be abundant in valuable ore. Although the Government does not enter into any extensive mining operations itself, it has, however, reserved the exclusive right over this branch of commerce, both in gold and silver. All the products are entered in the General Department of Mines of Siberia at Barndoul, in return for which the parties are given a receipt, or bill, payable at a few months' sight, in legal coin at St. Petersburg. The precious metals are afterwards conveyed to the fortress of this capital to be disposed of to melters, or specially licensed persons, who are obliged to give an account how it is to be disposed of to the authorities. The Government, so as to have an absolute control over the working of the mines, has appointed a certain number of officers of the imperial corps of miners in the different districts where they are being worked. Besides this, they furnish to the licensed parties a police force, consisting of detachments of cossacks, on the payment of a small remuneration. The generality of these mines are worked by those who have been exiled to Siberia for political offences and serfs, but the authorities are doing all they can to introduce machinery; and, even the Emperor himself is most desirous to ameliorate the condition of this portion of his wretched subjects, exposed as they are to, besides other sufferings, all the rigours of a most ungenial climate.

THE MECHANICAL PREPARATION OF CALAMINE AND GALENA IN UPPER SILESIA.—Germany may justly be considered the birthplace of mining enterprise, and the inventors of machinery to work and wash her ores, which have been resorted to and improved upon by England and France, the two great mining nations of Europe, and also the new mineral world of South America. Many descriptions of the different methods of working the gold and silver mines of Mexico, Columbia, Peru, and Chili, and the washing of the auriferous sands of those countries and the Brazils are well known to the scientific world in general, but the resources of Silesia are very little known, nor the minerals it possesses. The washing of calamine and galena give employment to some thousands of the population, and, perhaps, no country has more excelled than Upper Silesia in the washing of the galena, particularly at Tarnowitz. In France, they have but few mines compared with those of Germany—consequently, they do not devote that attention to the working of any others but iron, which are at present the most profitable, in consequence of the rapid progress now making all over the continent in railways. In Belgium they are actively employed in not only advancing the trade in calamine and galena, but that of zinc, which promises to be one of the most prosperous ores for that country, as the mines of calamine belonging to the company of La Vieille-Montagne, Engis, and the new association of La Nouvelle Montagne, will attest. Upper Silesia is making a vigorous strive to compete with other nations, and with the opportunities she has of machinery, coals, and mineral productions, there is little doubt but that she will be ultimately enabled to combat against the monopoly that is attempted to overwhelm her by the adjoining states.

COLOSSAL MANUFACTURING ESTABLISHMENT.—There is now in full operation at St. Petersburg, perhaps the most extraordinary, as well as gigantic commercial establishment which can be found in the history of the world, ancient or modern. Messrs. Eastwick and Harrison, the famed locomotive engine and boiler makers, of Philadelphia, having succeeded in obtaining the great contract for the construction of the locomotive requirements for the system of railroads about being carried out in Russia, have located themselves there—but built a manufactory of immense extent, in which 3500 men are constantly employed, and the conducting of which there are some curious features. To keep order among such a congregation—exceeding the whole population of a good-sized town, and consisting of English, American, Scotch, Irish, German, and Russian—a company of soldiers is kept on duty at the works, and a perfect police force, whose duties are commuted to the establishment. Refractory men of every nation are discharged for irregular conduct, excepting Russian, and these (we suppose it is to inspire them with a love for their country and admiration for the *gentle Nicholas*) are, for the slightest offence, immediately tied up to the triangles, soundly flogged, and sent again to their work. It is but justice to Messrs. Eastwick and Harrison to say, that they have strongly appealed against this treatment, so peculiar to this semi-barbarous nation, but without effect. The plan of paying this enormous multitude is ingenious; on being engaged, the man's name is, we believe, not even asked, but he is presented with a medal, numbered: in the pay-house are 3500 wooden boxes, and, on presenting himself on Saturday night for his pay, the clerk hands him his money, takes his medal as a receipt, which is dropped into the box of its number, and gives him another medal, as a pledge of engagement for the following week. We are promised a plan of the works, with a more particular account of the methods adopted; and as the principles upon which such a gigantic affair is conducted must be interesting, we shall have much pleasure in laying the particulars before our readers.

## THE GREAT WELSH MINING CAUSE.

One of the actions pending between William Malins, Esq., the Earl of Dunraven, and Sir Robert Price, commonly known as the "great Welsh mining cause"—viz., that of the Earl of Dunraven v. Malins, was tried at the Cardiff Assizes, on the 14th inst., before Mr. Justice Coltman and a special jury. Sir Thomas Wilde, Q.C., Mr. Chilton, Q.C., and Messrs. Williams and Richards, appeared on behalf of the noble plaintiff; and Mr. Cockburn, Q.C., and Messrs. Malins, Grove, and Benson, for the defendant.—The special jury were Messrs. Hollier, Fothergill, Wayne, Batchelor, Moggridge, Thomas, E. Morgan, L. Morgan, Williams, Wayne, Gape, and Yorath.

Mr. RICHARDS having opened the pleadings, Sir T. WILDE stated, that he had the honour, with his learned friends, to appear for the Earl of Dunraven; the action was brought to recover compensation for alleged breaches of covenants, in a lease granted by the plaintiff to the defendant. The lease was granted to work iron, coal, clay, and other minerals, in a workmanlike manner, and the charge was, that defendant, by his misconduct in such working, had inundated the mines and some adjoining ones, also worked by Sir R. Price, under lease from the plaintiff; and that, in their present state, it was nearly impossible to work or win coal, and the plaintiff thereby lost his dues; that they were now in such a state, that unless Mr. Malins was compelled to work them, no other tenant would do so, as great expense must be incurred.

The following is the order in which the witnesses were called:—*First day*: Messrs. James Cadman, mineral surveyor, Pontypool; William Habakkuk, surveyor, Nantyglo; M. G. Stewart, colliery viewer, Swansea; J. Petherick, Llynvi Iron-Works.—*Second day*: Messrs. C. J. Hampton, Maesteg Iron-Works; William David, mineral agent, Cambrian Iron-Works; A. O. Davies, mineral surveyor, Newbridge; George Martin, mineral agent, Dowlais Iron-Works; Henry Kirkhouse, mineral surveyor, Neath; Daniel Howell, collier, late in Messrs. Malins' employ.—*Third day*: Frank Forster, Esq., civil and mining engineer, Bangor, North Wales; Prof. Sopwith, F.G.S., London; and Dr. Buckland, Christ-church, Oxford.

A full report of the evidence, being merely a dry matter of detail, and having constant reference to maps, plans, &c., is entirely unnecessary; the general evidence went to show that, in working the mines, the defendant not only did not work them according to the terms presented in the covenants of the lease, but also, that they were worked in "an unmerciful and injudicious manner."—Dr. Buckland's evidence excited much interest; he said that, if the theory attempted to be established by Mr. Malins were a correct one, he should have to recast a whole chapter in the *Bridgewater Treatise*, and that the conclusions he had arrived at, after thirty years' close application, must be all wrong; but which he was by no means prepared to admit, having carefully examined the property in dispute.

Mr. COCKBURN, in a masterly and able speech of three hours, addressed the jury for the defence, but declined calling any witnesses, when his lordship summed up, and the jury, after one hour's deliberation, returned a verdict for the plaintiff—damages 1d., which, being in an action for breach of covenant, carries costs. The witnesses on each side amounted to upwards of sixty, and the action leading from the same circumstances, Malins v. Sir R. Price, was made a *remort*, and several of the agents have received notice to appear at the next Glamorganshire Assizes in behalf of Sir R. Price.

ROYAL SANTIAGO MINING COMPANY.—(From a Correspondent.)—The declaration made at the meeting last week by the chairman and directors of this company—that there was only a dividend of 12. 10s. per share to be paid on the 7000 shares issued by them—has caused a general dissatisfaction among the shareholders, as they were led to believe that the company was in an improving state; which is the case, as this is one of the best mining speculations, and yields more than any other of the transatlantic enterprises. The query is this, why should our directors keep back 8000L. which they say is placed to the reserved fund: thereby increasing that item to 47,000L.; and they now come forth to pay our dividends with only 10,500L., when we ought to have had at least 2L. to 2L. 10s. paid on each share, which would have left the appropriated reserved fund at 39,000L., which is quite sufficient to meet any contingencies, or demands, that may arise upon the funds for legal proceeds that may be instituted by the Cobre Company, which, it appears, has more *brass* than *gold* or *brains*?—Sir Isaac Lyon Goldsmid, one of the directors, not wishing to offend in a direct manner any of the hon. gentlemen, right and left of him, thought, that so small a dividend did not, in his opinion, meet the approbation of the meeting: and he trusted that the next dividend would be declared more satisfactory to all parties. From observations made by several of the shareholders, there is far from being a unanimity, or cordial feeling, evinced at the manner the funds of this company are appropriated, and all they want is *Justitia et economia*.

THE MINES OF SPAIN.—The mineral riches of fair Iberia, one of the finest countries in the world, are but little known, having been the victim for nearly the last forty years to the persecutions of a bigoted monarchy, and all the horrors of the priesthood, the inquisition, and the invasion of the merciless armies of Napoleon; but, of later years, the sanguinary civil war, that destroyed all confidence and the impetus of enterprise, has ceased. Spain, which was once the mistress of the treasures of the mineral kingdoms of Mexico, Columbia, Peru, Chili, and the whole of South America, like Rome of old, is reduced to the lowest state of poverty and classification among the nations of Europe. She has now only to depend upon her own resources and industry, to rise from the degraded state into which she has fallen. The cry of civil war should, as it will no doubt, shortly turn into the welcome cheer of peace, and ere long it is to be hoped, that she will once more become what she formerly was—an enterprising nation. The mines of Spain are unbounded, but only want the hand of industry and machinery to work them; silver, iron, copper, lead, tin, and other ores, are found in abundance in the different provinces, both north and south; in her magnificent cordilleras, there are also some valuable gold mines, but particularly quicksilver, among which must be named the celebrated mines of Almaden, now working by Englishmen, and which are a sort of freehold to the house of Rothschild, and furnish the mines of Mexico and South America the means of amalgamating their ores. The iron and steel manufactures of Toledo are renowned all over the world for their superior quality. This country has opened a wide field for British enterprise and speculation. Railways will shortly be established from one end of the kingdom to the other; thousands of her peasantry will be put into employment, in working her extensive coal mines, of which few countries are more abundant, and laying down the lines that are now in progress. A new era is rapidly arriving for that gifted country of Nature, the most fertile and most salubrious of any in the world; the fetters of superstition and ignorance will soon give way to enlightenment and civilisation; her nearly deserted villages and uncultivated fields will be populated, and yield forth their golden harvests; her hidden mineral treasures will be resuscitated from their long embowelled secrecy from man, by the hand of enterprise and industry of the nineteenth century.

EXPLORING THE RIVER AMAZONES, IN SOUTH AMERICA.—This expedition occupies the attention of the scientific body in Paris, as it is undertaken by French engineers, who expect to reap a good harvest. The object of this speculation is, to explore the River Amazon, under the sanction of the Bolivian Government, from its mouth to the foot of the Cordilleras, so as to make a survey, and see how far it will be practicable to render this magnificent river navigable, and open a free communication into the heart of southern America with the Atlantic Ocean. It offers every facility for the enterprise, as vessels can already penetrate up for 1500 miles; and it is only a distance of 180 miles that will have to be overcome, part of which must be done by blasting. A squadron of five steamers has been contracted for at Glasgow for the expedition. Several eminent French engineers have already sailed for Bolivia, and are to descend at the River Beni, and meet the steamers at the cataracts, that being the point agreed upon where the commission will unite to form their plan of exploration, and the works intended to be executed by the Bolivian Government. Should this grand scheme be successful, it will be the means of opening a wide field for mining enterprise, as Bolivia is one of the richest mineral republics of that vast continent; but, being a central state, it has not the means of a conveyance for shipment, unless round Cape Horn, and that at an enormous expense. The opening of the River Amazon, the finest in southern America, will cause a wonderful increase in commercial transactions with that country nearly unknown to Europeans.

AUSTRALIAN LEAD ORE.—A quantity of lead ore, of immense richness, has been received in Liverpool from Sydney, New South Wales. It contains 70 per cent. of lead, and silver at the rate of about 1 lb. to a ton of ore.—*Liverpool Times*.—[The quality of this ore does not seem to us to deserve the eulogy implied in the term *immense riches*; 70 per cent. of lead in the ton of ore, and 16 oz. of silver to the ton of metal, is a produce of ordinary occurrence.]

## Original Correspondence.

## ON THE CALCINATION OF SULPHUROUS ORES.

SIR.—I have been much interested in the perusal of Mr. Crowe's account of the process of copper smelting in Norway, and as he invites others to afford information upon the subject—and I feel assured you are always ready to find space in your valuable paper for such matter as may appear worthy of insertion—I take the liberty of intruding upon you with a few observations relating to the calcination of copper and other ores containing sulphur. The *Mining Journal* has on former occasions teemed with communications from various correspondents, pointing out the importance of improving our smelting processes, and more especially has the question of becoming our own sulphur suppliers been frequently agitated, and still the copper smelters and others go on poisoning the country with their noxious gases without having yet applied a remedy, although, if I mistake not, your columns contain one that appears, in my humble opinion, likely to be efficient, and, at the same time, inexpensive in its application.

Turning to the *Mining Journal* of 19th August, 1843, I there find the specification of a process patented by Mr. Rodgers, for the separation of sulphur from mineral substances, which, for simplicity and truthfulness to Nature, cannot be surpassed; for, as Nature works in mineral veins, by converting the sulphurites into oxides or gossans, and native metals, so Mr. Rodgers's process would carry the same principle into the smelting-house. His plan is to throw a jet of steam upon and over the red-hot ore during the process of calcination, which it materially assists by the double decomposition and affinity of the elements of the water and of the ore—the hydrogen of the water combining with, and carrying off, the sulphur, and the oxygen combining with the liberated metal, and forming an oxide of the same metal. There can be no reasonable doubt that, by throwing steam from time to time over the red-hot ore, either of copper, iron, or silver, the sulphur will be more readily separated and converted into sulphurated hydrogen gas, and the metal will not only be oxidised, but also partially reduced to the metallic state—silver, probably, wholly so, from its less retentive affinity for oxygen. When we consider the number of operations in the copper smelting process, and that by the use of the steam all the sulphur may be expelled, if required, at one calcination, it does seem surprising that our copper smelters have not at all events tried it; and yet I understand, upon inquiry, that such is the case, and that from want of means or connections on the part of the patentee, the patent is, as it were, dormant. The capabilities of the process, however, do not rest here. It may be used for procuring sulphur or sulphuric acid, which may be obtained from the sulphurated hydrogen by means of existing processes or known chemical properties, one of which I will briefly state. By bringing the sulphurated hydrogen gas in contact with sulphurous acid gas, the two noxious gases mutually destroy each other, and in their room sulphur and water are produced. This principle was, I perceive, patented by M. Duclos, but he does not say where his sulphurated hydrogen is to come from: this is supplied by Mr. Rodgers. Besides the application of this principle to the production of sulphur, I have no doubt that it might be advantageously used in all works which emit sulphurous acid gas to the injury of the surrounding neighbourhood, and I would propose to do this by passing into the flue of the furnace (which flue might be somewhat modified to suit the circumstances) a stream of sulphurated hydrogen gas, to be obtained by passing steam over iron pyrites in a separate furnace. Let the proportions of the two gases be properly regulated, and not only would there be no escape of noxious vapour, but a useful product would be obtained, and so, upon the principle of "setting a thief to catch a thief," I would send one gas to catch the other, and convert them both into useful members of society.

By the use of a jet of steam in the calcination of silver ores (sulphurites) the silver may be reduced at one operation to the metallic state, because silver does not retain oxygen like other metals. That Nature has so worked in forming the native silver found in different veins may be proved by a most beautiful experiment. If a piece of sulphurite of silver be heated in a common muffle, and a jet of steam be thrown upon it, the silver is brought out in beautiful metallic branches, similar to the native silver of the mines. In this way many splendid specimens have been produced in Germany, and are dispersed in the mineralogical collections of that country.

I recommend the use of steam to the Norwegian copper smelters, as peculiarly applicable for such ores as described by Mr. Crowe, and I would also hope to see it at length find favour in the eyes of our own countrymen. I join in the wish of Mr. Crowe, that others may impart such information as they may possess upon a subject of much importance, which cannot be better done than through the columns of your useful Journal.

## METALLIFEROUS.

## IMPROVEMENTS IN PRACTICAL MINING.

SIR.—Mr. James Rowe's letter is well worthy of the space it occupies in your last Journal; one would have thought you might have found room for such valuable information in an earlier Number. Some twenty years ago there was, and may be now, a machine on the same principle on the Bude Canal for the purpose of lifting the boats up an incline plane from one part of the canal to another; the vessel containing the water, descends through a perpendicular shaft. I know of no place in Wales where a machine of the plan described by your correspondent for bringing coals to the surface; much pains are often taken to get the coals up to the railway that leads to the drawing shaft. For the last twenty years, I have advocated the plan of employing the spare power of the pumping-engine to lift water to work water-wheels for winding, crushing, stamping, &c. Twenty years ago, pumping-engines were lifting about 50 millions, when steam-whims (winding-engines), were doing only 5 millions duty—as far as I know, the economy of the plan requires proving; although, some years since, I heard of an attempt being made in Cornwall, but have never heard the result. I hope, however, ere long to see some of your numerous correspondents taking up the subject, as well as what is doing in the different parts of the mining world to economise the working expenses; for the present, I will not intrude further on your valuable space.—DUNWY: July 16.

## MINING IN GALICIA, NORTH OF SPAIN.

SIR.—In your valued Journal of the 12th inst., you announce a forthcoming new company to work tin lodes in Galicia, under the *auspices* of a Baron Morat, a Frenchman, who has found it already very profitable to cater for the English speculators; of this you may be assured, by inquiry of the Asturian Mining Company, Austinfriars, and also of a Parliamentary Agent, in Parliament-street, whose name, for the moment, has escaped me, but in my next you shall have both his name and address. You say *auspices*—are the British public to understand (for to the French he is well known) that this Louis Tranquila Morat is a capitalist, a man of such known integrity and veracity, as to enlist themselves under his *auspices*—bless the word. You often remark, Mr. Editor, "look before you leap." This auspicious Baron, I have heard, is an ex-banker of Oviedo, late in the office of M. Adouin (the well-known banker of Paris), and may also be heard of as formerly in the service of M. Agnado. How delighted the shareholders must be to have such a protective adjunct and mineral surveyor to their intended society. No person who ever read Humboldt, ever doubted the presence of tin in Galicia. It is a jobbing age, Mr. Editor, but it is an accepted maxim, when persons obtrude themselves on the British public as the patrons of a society, that they should appear with a high character and standing. Louis Tranquila Morat can have no doubt of the identity of the writer of this letter, for which I hope you will permit a place in your independent Journal. A LONG RESIDENT IN ASTURIAS. Brighton, July 15.

## THE COAL MINES OF FRANCE, AND METHOD OF WORKING.

SIR.—The principle on which the coal mines of France are worked is not generally known in England; the following may not be uninteresting, therefore, to your numerous readers, as your Journal is the great medium of mining intelligence from all parts of the globe. First of all, the means of conveyance, we have three:—1. The carriage on the foundation of the galleries; 2. On the lines of tramroads in iron or wood; 3. By navigable galleries. On the first system, man is employed on the surface of the galleries as a porter or carrier, dragger and wheeler. All these means have been greatly depreciated by M. Gervoy; the carrying of loads is disappearing daily, according to the progress that is made in the mines. The average load per man varies from 40 kil. to 70 kil., but generally only 50 to 60 kil. (100 to 112 lbs. English). The distance gone over with the load is often as long as 6000 metres: the average distance, however, is about 4500; the carrying on the back is generally only for a short distance, less than 100 metres. The dragging in the mine galleries still exists in many parts of France;

sometimes it is done in a sort of tub, and, at others, in wicker hampers. These slide along an iron rail; the load generally is about an hectolitre and a half, or 120 kil. (240 lbs.); this varies from 10 to 150 kil., according to the roads. The distance ran is about 6000 metres: when the galleries are good, children from sixteen to eighteen years of age can work without inconvenience. The dragging is longer than carrying, being from 150 to 200 metres and more; the wheeling, or barrowing, is worked upon wooden lines, divided into stoppages, or relays, from 20 to 30 metres: the load is 160 lbs., and the distance ran 8600 metres. In a great number of the mines in France, horses are used for dragging; their utility varies much more than that of men, because it is greatly influenced by the state of the galleries, the temperature and ventilation, &c. The two latter elements in particular have a great effect upon them. In mines that are warm and badly ventilated, the horses become so rapidly depressed that they cannot use them; on the contrary, the other way they are very serviceable: the load is about 500 lbs., and the distance 7000 metres. In mines where the roads are good, and strong horses are used, the load is 1000 lbs., and the distance 5000 metres. In some mines the wooden rail, or tram, is used, but the iron rail is now generally adopted for the lines unless there is too much water to corrode them, and then we have wood. The thickness of the iron rails is according to the weight they have to support, and the waggon differ in shape, particularly in the metallic mines; the inclination of the iron rails ought to be calculated according to the size of the mine. With the cars that are drawn by men the descent is so made that they run down by themselves—the man placing himself behind. In working a long gallery, so as to lay down an iron line, great attention should be paid, as they then can judge which will be most suitable for horses or men.

The following results are made from a number of observations, selected in the different mines of France, Belgium, and Germany. In general, the carrying is done by children, from twelve to sixteen years of age, in narrow passages; but, when men are employed, a wheeler can convey 455 hectolitres to the distance of thirty metres, each hectolitre being 160 lbs.; they work by relays of thirty metres, therefore each one makes 260 trips. A good wheeler can in the course of a day work a task and a quarter, and even one-half, varying from 1,365,000 to 1,638,000 kil. to 1 metre. On iron rails, having at least 1000 to 1200 metres in length, and an adequate descent, each horse can drag 8000 lbs.; but in narrow lines, and in mines that are warm or badly ventilated, the load never exceeds 2200 lbs., and the distance 400 to 500 metres only. The working of the mines in this country have, however, been greatly improved, by the introduction of the English method. The system of navigable galleries is only employed in a few mines, the first application of which was made in the mines of Worsley, near Manchester, in the middle of the last century. Since that period it has been introduced into Upper and Lower Silesia, and in a few mines in the environs of Clausthal and Hartz, in Germany, but not on so large a scale as at Worsley, where the distance is 15,800 metres; the lower galleries are 18,000 metres, from which the coal is raised to the middle stage by means of steam-power, and the boats hold from nine to ten tons, or 2500 lbs. of coal, which six men unload with the greatest quickness, on an average of forty boats in the hour, being 360 tons, or 125,000 lbs. per man. The miners work laying down on their backs, with their feet against the gallery, which method is less fatiguing than any other. In the navigable subterraneous passages of Hartz it has been found that boats holding six tons, and going the length of 3000 metres, one man can do the work of two horses on the common road. Navigable galleries require greater caution in their formation, and a deeper cutting, than iron rails; they are, therefore, not generally adopted, unless they cannot introduce horses into the mines, as, if men were to be employed on the iron rails, navigable canals are the most advantageous. But for distances from 300, 500, to 600 metres, which is the general length, the use of horses is more suitable, as the loading and unloading is saved, and a more rapid conveyance gained; but in short distances men are more serviceable, as they can go quicker. It unfortunately happens that fire-damp prevails too frequently, not only in the mines of France but Germany, and a commission of scientific men have this subject under their serious consideration; for, although the Sir Humphry Davy lamp has been found a most valuable preservative, accidents are, notwithstanding, continually occurring, although every improvement that can be made is made in the system of working our mines.—A CORRESPONDENT: Liege, June 24.

## THE MINERAL PRODUCTION OF BELGIUM.

SIR.—The *Mining Journal* being the great medium of communicating information relative to mining operations in Great Britain, America, and the different states of Europe, it will, no doubt, be interesting to your numerous readers to have some little idea of the progress of mining enterprise in this country; I, therefore, transmit you a concise official report of our mineral productions. The rapid advancement that is making in England, France, Germany, and the whole of the north, as well as the south, of Europe, in railways and iron steamboats, has caused a most extraordinary demand for that article both in England and this country, which are the most favoured by Nature for its abundant production, added to an unbounded supply of coal. The province of Liege has, at this moment, no less than twelve large iron foundries constantly at work. In consequence of the extensive demands that we have received for the furnishing of rails to the different companies now forming in Germany and in France, the whole of the iron-works in Belgium are at present in the greatest activity, which, unfortunately, has given the masters the ambition of rising the prices nearly to those of England, but this state of things cannot last long, the railway mania must eventually subside, when the price of iron must come to its proper level; but, in the meantime, these exorbitant prices are most prejudicial to commerce in general. This is more particularly felt in all the minor manufactories of iron wares, nails, &c., which prevents a fair competition with other countries. The nail manufactories of Liege have had a very numerous meeting, petitioning the railway directors of the line to Antwerp to reduce their charges on merchandise, so that they may compete with those of Charleroi, who have a reduction of 75 per cent. over the canal traffic. They have also petitioned Government to enter into negotiations with the Hanoverian Customs, which, by the new tariff have excluded our nail trade, and that a regular steam communication be established between Antwerp and Hamburg, for the transmission of our productions to the more northern parts of Europe.

Zinc.—This branch of industry is one that has made the greatest development in the province of Liege for some years. For thirty years this was monopolised by one firm, and it did not exceed, on an average, more than 2,000,000 lbs. per annum in 1836, it doubled in 1837, and tripled in 1838. The Society of Corphalia, that of Prayon called La Nouvelle Montagne (the new), and M. de Laminne, at Amapin, have successively risen up within the last fifteen years against that of M. Mosselman. In 1837, the successors of the latter converted it into a family association, under the name of the Vieille Montagne (the old). There is a very large concern at Moresnet, where the working of calamine is carried on to a great extent. The quantity of zinc annually manufactured by the different societies in this province, which, ten years ago, was only 1000 tons, is now 14,000,000 lbs. per annum, of which the Society of the Vieille Montagne furnishes the greater proportion. The manufacturing of zinc, and the extraction of calamine in this district, employs 1200 the workmen. This is a branch of the greatest importance to Liege, as it is the means of causing constant work, and a great demand for coals and cast-iron. The annual consumption of coal for these establishments alone is 46,160 tons, for the casting of iron 1,000,000 lbs. (500,000 kil.), and forging 160,000 lbs. Besides this there are 14,000,000 lbs. of ordinary stone coal from the province of Namur, part of which is used by the boats running between the Meuse and Ourthe. Of the 14,000,000 lbs. of zinc annually manufactured, that is to say two-thirds, or 4300 to 4400 tons are exported to France in its rough state by water conveyance; there remains, therefore, about 5,100,000 lbs. in this country—viz., 800,000 lbs. in rough state, and the remainder to be sheeted, the loss on which is about 200,000 lbs.

The average quantity of sheet zinc consumed annually is—

Belgium	1,600,000 pounds.
Holland	900,000 "
Hamburg	200,000 "
North America	1,100,000 "
Brazil, &c.	200,000 "

Total ..... 4,000,000 pounds.

After undergoing various changes in price, in its rough state, it has been for some years at 2d. 4s. per 100 kil. (2 cwt.), and leaving a good profit. Sheet zinc is worth 10s. to 12s. more than the other, and leaves a large profit to the manufacturer.

Lead.—The working of this metal, which had been for some time abandoned, is resumed with vigour and success throughout Belgium, as a great many extensive establishments have entered into contract for furnishing the lead ore; the quality is good, and can be well substituted for the leads of England or Spain.—In Copper there has been very little speculation, in

consequence of the export duty that has hitherto existed, but Government having reduced it, there is no doubt it will again be resumed, as we have throughout Belgium some valuable copper mines, but they only want working with spirit.—Our Coal mines are now in active work by steam machinery, as very extensive contracts have been entered into with the French and Prussian Governments, as well as for locomotives, as we can manufacture them much cheaper than you can in England; it must be remarked, however, that our best workmen are imported from Great Britain, and are fully developing their industry among us.—E. B.: Liege, July 9.

## ASSAY AND ANALYSES OF MINERALS—NO. III.

## ASSAY OF COPPER ORE FOR SILVER.

400 grs. of copper ore.
600 grs. of litharge.
Flour-spar
Lime
Borax
Tartar
Nitre.

a good ladle full of each, and about one ounce of iron nails, in orbit that the sulphur invariably found in copper ores may attach itself to it, and form a sulphate of iron—the poorer the ore, or, more properly, the greater quantity of copper and sulphur the ore contains, more lead or litharge is required. When the button of lead is obtained, proceed by the ordinary process of cupellation.—J. T. C.

## DEVELOPMENT OF MINERAL WEALTH IN IRELAND.

The construction of railways in Ireland, independent of the immediate advantages in the shape of employment for the half-starved labouring classes, and outlay of capital in various ways, and of the more remote results in the improvement and extension of trade, commerce, and agriculture, by the facility of transit of goods and persons—to say nothing of the social and other advantages of unlimited intercourse between the inhabitants of the different provinces of that country—will have a most important influence on its prosperity, in respect to a full development of its riches in the mineral department of Nature's most useful productions, and which were heretofore of little benefit to the nation, or to individuals, by reason of the difficulties, and more frequently the want, of conveyance, by either land or water carriage, in the mineral districts. Of the existence in the interior of the country of beds of the different species and subspecies of that combustible mineral, so essential for man's general uses, coal, there is as sufficient evidence as there is of the great difficulty, or rather impracticability, of applying it to those uses, for want of modes of conveying it from the places where it can be procured to those where it would be consumed. In like manner, rich ores of copper, lead, and silver, are to be found in several of the mountains of the interior; as are also quarries of a beautiful kind of marble, of granite, and of fine slate; but all rendered unavailable to national or individual benefit, for a like reason. It is obvious that, in these districts, mines or quarries cannot be worked with advantage, for want of facilities of transit for the article produced from them, and, therefore, do we consider the constructions of railroads one of the most important advances towards national prosperity in Ireland. Some years since, when the English capitalists were tempted, by prospects of unbounded gain, to speculate in South American mines—the difficulty of transit, by land, of the material from which was infinitely greater than would be that from mines in the interior, and the mountainous districts of Ireland—a diversion in favour of similar speculation in the last-mentioned country was made by a few capitalists in London, and a company was formed, and successful experiments made in working mines and quarries on the sea-coast, and in the vicinity of navigable rivers in the southwestern districts; but, beyond such localities, every mine or quarry opened was found to be unproductive of profit, chiefly, if not altogether, for want of facility of transit. The copper mines of Berehaven, in the county of Cork, and known in England as the "Allibies Mines," yield one of the richest ores coming into the Swanso mineral market; but, rich and abundant in the lode as that ore is, it would be divested of a considerable portion of its value to the proprietors of the mines, had it not the important advantage of being procured in the immediate vicinity of water-carriage; in fact, they are worked on the very brink of the sea. In the same district, a few miles distant from the sea, and remote from land or water conveyance, ore, as rich and as abundant in the lode may be found, but want of the means of conveyance from the mines, preclude the possibility of mining for them with profit commensurate to the outlay.

As we have touched upon the subject of mineral productions, in reference to the national and particular advantages to be derived from the construction of railroads in Ireland, we cannot forbear allusion to the discovery of an extensive bed of manganese, made a few years since in the vicinity of Glandore harbour, in the county of Cork, and since partially, or on a very limited scale, worked by some gentlemen having an interest in the land, a few feet beneath the surface of which it is found in apparently inexhaustible abundance, and in a widely-extended space. The locality of this bed of a very valuable mineral possesses the advantage of being within half a mile of a shipping pier, in a safe and commodious harbour, and yet no capitalists have ventured to speculate in an extensive, and, as doubtless it would be, a profitable working of the mine. In 1843, when in the progress of a tour through that mining district of the county of Cork, we visited this manganese mine: there were prepared for sale about one thousand tons of the mineral. It is taken out of the mine in detached blocks, or masses, of an grotesque and fantastic formation as flint stones present when quarried from the chalk cliffs, but greatly larger in size. To prepare it for market, it is merely crushed, or granulated by means of the hammer in a mill, to about the size of small gravel, and then purified from extraneous matter by passing a stream of water over it, and, when dry, sifted into sizes, and separated into heaps, according to its sizes. One of the proprietors informed us that some hundred tons of it had been shipped for Liverpool, but the price per ton it was likely to bring he could not then conjecture. Its quality, he said, had been tested, and declared to be equal to the best as yet discovered in England, and any persons interested may form their own opinion from personal inspection of a sample which lies at our office. In the neighbourhood of this manganese mine is a slate quarry, from which is procured slate, of a quality not inferior to that of the Bangor slate. This quarry is also worked on a small scale by a private individual, but to the extent it is worked it is profitable. Some miles further on the sea coast are the Audley copper mines, but litigation between the Audley family and the English company that worked them has, for a time, suspended the work. Copper mines and slate quarries have been opened in other localities in this district, but want of capital to extensively and effectively work them is the universal complaint, although many of them have no convenience of either land or water carriage. The projected continuation of the railway from Cork to Bantry, and passing through this district, so abounding in mineral productions, will, however, if carried into effect, lead to a more extensive embarkation of capital, in working both its mines and quarries. The manganese mine at Glandore can, as we think, scarcely fail to attract the attention of capitalists, should it be the desire of the present proprietors to admit into the concern a sufficiency of capital to work it effectively; and here it may not be amiss to observe, that manganese, which has been for a long time used alone in the making of glass and pottery, has, since the discovery of chlorine, which is procured by distilling a mixture of black oxide of manganese with muriatic acid, become of more extensive utility, and is, of course, enhanced in value. In the neighbourhood of Exeter, the best in England is reported to be found; but we are assured that the mineral discovered at Glandore is equal to it in quality, and we know it to be of inexhaustible abundance there, and more easily and at smaller cost procurable from the mine, and less expensive in the preparation, and in the shipping it for Liverpool or other mineral market.

## MINE ACCIDENTS.

Colliery Accidents—*Singular Superstition.*—In South Staffordshire, in cases of fatal accident, every man at work in the mine leaves it until the inquest has been held, and the body buried; in some instances, where the sufferers are buried deep under a fall of coal,

## THE SCIENCE OF GEOLOGY.

The study of the formation of the earth, which, from the earliest periods of history, has occasioned so much controversy, arising from the errors conceived and promulgated, is now become a science intensely interesting in its investigation, and of the utmost importance to the social happiness of mankind. The great and general truths of the science of geology have been long arrived at, and are now fixed on so firm a basis, and are so self-evident to the minds of all who delight in a careful search into the wonders of Nature, that no frivolous contradiction or opposition is offered to them; but still, in many of the details, or subdivisions, of the science, in many of the causes which produce certain effects, a variety of opinions are yet held, and opposing theories thus promulgated, the correctness of which can only be established by facts; and, as thus *facts* are of such paramount importance, in confirming the great truths of geology, it is pleasing to know that there are men, who, having given their whole mind to its study, will receive nothing but what can be relied on from actual witness of the phenomena; such a man is Mr. Elias Hall, of Castleton, who has, for near sixty years, devoted his mind to this one great object, and more particularly as regards the geology of the counties of Derby, Yorkshire, Lancashire, Cheshire, and Staffordshire; he has endeavoured so to investigate the general phenomena of the strata, and practically to illustrate all that had been previously written on the subject, as to leave no doubt on the mind of those who are interested therein.

We have been favoured by this gentleman with his manuscript, from which a paper was read at the meeting at Cambridge of the British Association for the Advancement of Science, some extracts from which will doubtless be acceptable to our readers. As an introduction, he observes, "The science of geology being the knowledge of the earth's structure, as far as lies open to our observation, and the ancient history of the globe one of the most curious subjects that can engage the attention of enlightened men, while to the geologist the changes which the surface of our earth has undergone are of the most important and interesting nature, his mind is naturally led on by a desire of fresh knowledge, is not content with a superficial view of their changes, but his imagination receives additional vigour and activity, when he enters on a new field of discovery; he delights in tracing the nature of the agents that have once been active, in ascertaining how far they are now operating, and in anticipating the results of their continuation. It is necessary, therefore, to exercise the greatest caution, lest the ardent imagination of the geologist should lead him into error, and to draw false conclusions, for results promulgated to the world upon data not sufficiently accurate, must not only create confusion, and generate numberless errors, but must ultimately tend to prejudice their author in the scientific world." We give some extracts from his description of the carboniferous limestone rocks of Derbyshire and Lancashire, as a specimen of the clear, yet careful, manner in which he conveys his information. The carboniferous limestone, sometimes called the mountain limestone, from its forming considerable hills, or metalliferous limestone, from its mineral riches. It extends over a surface of about twenty-three miles long by seven broad, containing 161 superficial miles; in this district the lead mines are situated—(here follows a list of all the towns and villages situated on or near the bassett, or outcrop)—the principal mines are situated in the three top rock, the lowest rock containing but few mineral veins, among its numerous open fissures and caverns, and, as far as we know, the whole is about 400 yards thick. Rivers, which flow across it, are suddenly engulfed, pursuing a subterranean course to a considerable distance, as the river Hamps, at Waterhouses, the river Manigold, near Wetton, in Staffordshire, and the Peak water at Castleton, certify. The hills and mountains present rocky dales and mural precipices; hence it presents some of the most picturesque and romantic scenery that England can boast, such as Dove Dale, Matlock Dale, Monsal Dale, Middleton Dale, Weydale, Winnet's Dale, and Viagelly Dale. The toadstones, basalt, or trap rocks, are of various colours, from a dark brownish grey to a light coloured ochre, full of green spots, and containing globules of calcareous spar; these nodules, when exposed on the surface, fall out, and leave the toadstone with a cavernous or porous aspect; in some places it has the appearance of a hard, compact, ferruginous stone, in texture and hardness similar to those of the Giant's Causeway in Ireland, and Staffs in Scotland, in the shape of a pentagonal basaltic column, with patches, or streaks, of red jasper; in some places it is schistose, as at Litton—in others, regularly stratified, inclosing nodules of limestone, as at Ashover. He then gives a long and carefully detailed description of the course of the toadstone, its thickness when it has been sunk through, and those places where shafts have been sunk in the basalt, without reaching the limestone below. The direction of the veins, containing lead ore, appears to be nearly (magnetic) east and west in the High Peak from Castleton to Bakewell, but near Worksop, in the Low Peak, the veins, or pipes, of ore range from south-east to north-west.

The rakes, or veins, of lead ore, in descending, are always terminated, or cut off, by the toadstone, whose course is continuous, separating the high vein from that below, which is commonly not perpendicular to the higher, but sideways several yards; it is remarkable that the vein will contract, or become narrower, as it approaches the toadstone for several yards above and below it; the thin clays sometimes pass the veins, and separate them as completely, and in the same manner; some persons have supposed these toadstones to have been a subsequent formation. The sides, or walls, of a vein are commonly lined by fluor, caulk (or calcareous) spar, termed by the miners "vein stuff;" between or against these sides lies the ore, which sometimes fills the space between them, and is then termed "a rib of ore;" but it sometimes happens that the vein stuff on each wall of the vein nearly completely occupies it, and forming what may be termed, from its appearance, a vertical crack down the vein; the two faces in contact appear as though they had been polished, are ribbed or fluted horizontally, and the face of each is sometimes covered with a remarkably thin coating of lead ore; these planes, when separated, are the slicksides of the mineralogist; when one side of the vein stuff is removed, the other side cracks, but if the miner makes small holes about six inches apart, and four inches deep, in one surface after the other is removed, on returning a few hours after, he finds every part so treated broken to his hand, as in the Gang Mine, near Cromford; Ladywash and Haycliff, near Eyam; Oden Mine, near Castleton. In the year 1738 a tremendous explosion happened in the mine called Haycliff, which, at one blast, detached from thirty to forty tons of mineral, and, at the same time, a man was blown several fathoms upwards, and lodged upon the floor above. A peculiar property of the toadstone is the closeness of its texture, for when the water is too powerful for an engine, or the expense too great, a shaft is sunk upon the rise of the strata, and a drift, or gallery, is driven under the toadstone to the corresponding fissure beneath the first shaft, which never fails producing a dry work, for the close texture of the toadstone will not filter water sufficient to inconvenience the workmen below. Another property of the toadstone is, that it frequently fills up fissures in the limestone strata, lying immediately under it, and at Salter's Way and Slack Mines, on Bonny Moor, where two shafts are sunk forty yards in toadstone to the limestone, a third shaft was sunk between the two, from 80 to 100 yards deep, and did not find the bottom of the toadstone.

At Black Hilllock, on Tideswell Moor, the third toadstone was sunk into 200 yards, and no bottom found. Here the owner was led into error by his informant, who supposed the different sinkings to be in the same strata, while, in fact, Black Hilllock only is upon the third toadstone, and all the other sinkings on the second. The clay is calcined or burnt, when in contact with the toadstone, as at Henty and Cawlow, near Castleton. It is not very common to find lead veins, bearing ore, penetrate the great limestone shale; Oden Mine, at Castleton, and Shaw Engine, near Eyam, are exceptions; in the latter, a vein of lead ore ascended into the shale thirty or forty yards. Lead ore has been got in the second coal shale and coal, near Whaley Bridge, Derbyshire, and at Broomhead, in Yorkshire. In some few instances the toadstone beds carry lead ore, usually, however, in small strings. In Nunley Mine, the lead ore was found in toadstone, as stated by Mr. Fauquier de St. Fond, notwithstanding the assertions of Mr. Mawie to the contrary; it was worked to a profit in toadstone also, in the Seven Rakes Mine, near Matlock.

Mr. Hall is evidently most particular in noticing any phenomena, which may throw a light on doubtful points in his much-loved science. He records the following:—In 1822, two miners, being in Oxlow Mine, Boston vein, in Peak Forest, heard a dreadful report, superior to the loudest cannon, which rent the solid rock, on the south side of the south vein, in a vertical direction, to the depth of thirty-six yards below the place where the miners stood, and sixteen yards above the same place; this was evident, but how far the rent exceeded this statement they had not the means of ascertaining. One part of the rent was wide enough to admit a man's body, and as sudden concussions and strange noises are often heard in mines, without the bearers being able to ascertain the cause, we here suggest, may

this not be the way in which all our mineral veins have been formed, and are still forming; the strata acted upon by internal pressure, magnetic influence, or its own gravity, suddenly cracks, and a cavity is formed; this cavity is, by the action of galvanic currents and other circumstances, filled with quartz, clay, and other adventitious substances, and metallic ores, forming in the end the lode from which our metals are extracted. Our space will not allow us, at present, to enter further upon the subject, but hope to be able to insert many of Mr. Hall's future communications.

## Mining Correspondence.

## ENGLISH MINES.

## EAST TAMAR CONSOLIDATED MINES.

July 14.—We are getting on with the engine at Whitson as fast as possible; we are clearing the adit level south; we have cleared the adit level from Whitson to Lockridge, and cannot find any ground left, but all is worked away. Our whim is set up at Furshill, and we are clearing the shaft. The masons have not commenced building at Furshill, as the plan of the engine-house has not arrived; I have written Mr. West, and expect it in a day or two. At Charlotte's the pitches are looking very well; the tributaries will get wages; we are also making dressing-floors at Furshill to commence dressing.—B. ROBINS.

GUNNIS LAKE MINING COMPANY.

July 14.—At Chilsworthy the lode in the adit level is eighteen inches wide, composed of spar and gossan. There has been no lode taken down in Bailey's engine-shaft since last report; this shaft is now about five fathoms under the adit level.

W. RICHARDS.

## WEST WHEEL JEWEL MINING ASSOCIATION.

July 14.—In the 100 fathom level west, on Wheal Jewel lode, the lode is still small and unproductive; in the 100 fathom level east, on ditto, we have intersected the lode east of the little cross-course in the past week, worth 10f. per fathom. In the eighty-five fathom level west, on ditto, the lode is two and a half feet wide, worth 8f. per fathom; in the eighty-five fathom level east, on ditto, the lode is two feet wide, in more settled ground, and looking promising for copper. In the seventy west, on ditto, the lode is without alteration since last report. In the eighty-five fathom level west, on ditto, the lode is without alteration; in the eighty-five fathom level west, on new south lode, the lode is one foot wide, composed of fine gossan and spar. In the forty-two fathom level east, on Buckingham's lode, the lode is six inches wide, unproductive. In the thirty fathom level east, on Morcom's lode, the lode is two feet wide, composed of spar, mudi, and spots of yellow ore; in the thirty fathom level west, on Tolcarne tin lode, the lode has not been taken down since my last. In Wilkinson's engine-shaft, sinking below the fifteen fathom level, the lode is three feet wide, composed of spar and spots of ore. S. LEAN. R. JOHNS.

COOK'S KITCHEN MINES.

July 12.—We are still driving on the flockan part of North Tincroft lode. In the seventy fathom level east the ground is favourable; ditto west the lode is three feet wide, producing good stones of ore, and looking promising. Eudie's lode, in the ninety-two fathom level, is three feet wide, and still unproductive. Chapple's lode, in the 170 fathom level west, is three and a half feet wide, and worth 7f. per fathom. Since our last there is not much alteration in the pitch east of the cross-cut, at the 160 fathom level, which is working at 3s. in the 12. In the rise in the back of the 160 fathom level, west of the cross-cut, we are daily expecting to hole to the winze sinking under the 148, which will then enable us to work the ground to great advantage; that part of the lode which we are carrying is three feet wide, and worth 10f. per fathom. The ground continues favourable in the winze sinking under the 148. In the 140 fathom level east the lode is four feet wide, and worth 5f. per fathom. Dunkin's lode, in the 160 fathom level west, is three feet wide, producing good stones of tin. In the cross-cut south from Rogers's shaft, at the 29 fm. level, we have cut a small branch of the lode, but think the main part is still further south. I cannot speak of any improvement in our tribute department since our last. A. EUDIE.

UNITED HILLS MINING COMPANY.

July 11.—In Williams's shaft the ground is a little improved. In the eighty fathom level, east of ditto, the lode is four feet wide, two feet on the south part of ore of average quality, worth 25f. per fathom; in the eighty fathom level, west of ditto, the lode is three and a half feet wide, poor. In the seventy fathom level, east of eastern shaft, the lode is three feet wide, one foot on the north part of fair quality, worth 15f. per fathom; in the seventy fathom level, west of the cross-cut, we are daily expecting to hole to the winze sinking under the 148, which will then enable us to work the ground to great advantage; that part of the lode which we are carrying is three feet wide, and worth 10f. per fathom. The ground continues favourable in the winze sinking under the 148. In the 140 fathom level east the lode is four feet wide, and worth 5f. per fathom. Dunkin's lode, in the 160 fathom level west, is three feet wide, producing good stones of tin. In the cross-cut south from Rogers's shaft, at the 29 fm. level, we have cut a small branch of the lode, but think the main part is still further south. I cannot speak of any improvement in our tribute department since our last. A. EUDIE.

T. TREVENEN. R. WILLIAMS.

## WHEAL SARAH MINING COMPANY.

July 12.—Although the ground in the shaft, sinking below the twenty fathom level, continues hard, the lode is still four feet wide, with vein of silver-lead ore, about eight inches wide, traversing on the foot-wall. The lode in the twenty fathom level north is two feet wide, composed chiefly of friable quartz and flockan, containing minute grains of lead; the lode in the south end is three feet wide, two feet of which consists of gossan, hornstone, and carbonate of iron, whilst a foot of it carries lead ore, producing saving work. The end, driving north-east from the old adit, is still in favourable ground. We have opened little on the lode mentioned in my last report; it is about three and a half feet wide, containing a little carbonate of lead, and showing other indications of a very promising character.

JOHN PRINCE.

## CALLINGTON MINING COMPANY.

July 14.—Johnson's engine-shaft is sunk four and a half fathoms below the 100 fathom level; the lode has not been taken down in either of the ends at this level for the past week. In the ninety fathom level, drivin: south, the ground is soft, lode worth 3f. per fathom; in the north end is producing silver-lead ores; the winze, sinking below this level, has been communicated with the level below. In the eighty fathom level, driving north, we are opening tribute ground; in the winze, sinking below this level, the lode has not been taken down. In the seventy fathom level, driving south, the lode is producing silver-lead ores. At the north mine, in the ninety fathom level, driving south, the ground is soft, lode worth 3f. per fathom. We have also commenced driving north, where the lode is worth 6f. per fathom. In the seventy fathom level the lode is worth 7f. per fathom. We have set a winze to sink from the sixty, for the purpose of ventilating this level. Our tribute pitches in both mines are working well, and we intend sampling on Saturday next.

J. T. PHILLIPS.

## TRELEIGH CONSOLS MINING COMPANY.

July 12.—Christoe's shaft, below the eighty fathom level, is sinking in the country; in the sump winze, below the eighty fathom level, no lode taken down. The Garden shaft, below the seventy, is sinking in the country in pretty klasses; in the seventy, west of Good Fortune, the lode is two feet wide, producing stones of ore; in the seventy, east of ditto, the lode is twenty inches wide, with but little mineral. In the sixty fathom level, west of ditto, the lode is three feet wide, worth 9f. per fathom; in the sixty, east of ditto, the lode is three feet wide, with stones of ore, rather more promising. In the fifty fathom level, west of Symons's, the lode is two feet wide, worth 8f. per fathom; in the fifty fathom level, west of ditto, the lode is twenty inches wide, worth 10f. per fathom; in the fifty fathom cross-cut north the ground is more favourable. In the thirty-four fathom level, west of ditto, the lode is eighteen inches wide, with stones of ore; in the adit, west of ditto, the lode is one foot wide, not much ore. We have set the back in the twenty fathom level, east and west of the rise, W. SYMONS.

## HOLMBUSH MINING COMPANY.

July 15.—In the 120 fathom level, west of the cross-cut, the lode is small and poor; in the south cross-cut the ground is favourable for driving. In the 110 fathom level, west of Hitchins's shaft, the lode is eighteen inches wide, and worth 25f. per fathom; in the stopes in the bottom of this level the lode is fifteen inches wide, and worth 15f. per fathom; in the stopes in the back of ditto, west of Hitchins's winze, the lode is twenty inches wide, and worth 28f. per fathom; in the stopes east of ditto the lode is fifteen inches wide, and worth 22f. per fathom; in the stopes west of the sump winze the lode is twenty inches wide, and worth 30f. per fathom; in the stopes east of Lobb's winze the lode is one foot wide, and worth 9f. per fathom; in the stopes west of Goldsworthy's winze the lode is one foot wide, and worth 10f. per fathom. In the 100 fathom level, west of Hitchins's shaft, we have opened through the lead lode, which is three feet wide, one foot of it being good saving work for silver-lead ore; we intend opening on its course north and south a few feet; in the stopes in the back of this level the lode is two feet wide, and worth 25f. per fathom. In the ninety fathom level west the lode continues small and poor. In the sixty-two fathom level west the lode is six inches wide, producing stones of ore. The riser against Bray's shaft has been employed fixing an air machine, putting in air pipes, &c.; at the eighty fathom level, they will commence raising in a day or two. The tribute department, on the whole, continues to turn out well.

T. RICHARDS.

## TRELLAWNT CONSOLS MINES.

Harrowbarrow, July 16.—We have since last report driven the seven fathoms level west three fathoms, through a lode about one foot wide, composed of mudic, peat, spar, and copper, but not rich—the ground favourable for driving; the seven fathom level west we have driven six fathoms, through a lode about two feet wide, composed of spar, mudic, flockan, and copper, and of a very kindly appearance; the men are suspended from the soul, or lead line, and are sinking a shaft on the George and Charlotte lode, on which we have a large gossan at surface. More particulars I shall be able to speak of after the next general meeting, which is to take place the 1st of August.

## HARROWBARROW CONSOLS.

The deep adit is cleared fifteen fathoms east of Hancock's shaft; at this point the lode is about two feet wide, with its regular and kindly appearance; a pair of tributaries are working on the copper lode in back of said level, and doing well on one-half tributary. Brewer's shaft has been sunk about two fathoms since my last report; at this point the lode is widening, and looking better than it did above; we have not yet the whim erected; we have been waiting for the iron, but hope to complete it in the course of the week.

## HARROWBARROW OLD MINE.

We are getting on with the surface work against the new engine arrives, and also with the necessary work for the smiths' and carpenters' shops; the main beam of the engine is cast, and materials daily arriving on the mine. The ten fathom level, on Wheal Brothers lode, is about two and a half feet wide, producing some good stones of lead and silver ore; the tributaries in back of said level are raising some good silver ore.

## WEST HOLMBUSH MINE.

We have driven about twenty fathoms more to drive to intersect the copper lode we cut in shooting, which is five feet wide, and which we were prevented sinking in, consequence of the surface water; the level is driving through a soft kindly killas. On the lead lode we have sunk 7 fms., and driven about five; it is 24 ft. wide, composed of prian, mica, mudic, spar, and gossan—a very kindly lode.

## GREAT WHEAL WILLIAMS MINE.

This mine is situated to the north of Wheal Fortescue and West Wheal Maria, west of Coombe Vale, and south of Wheal Concord. This set contains several lodes passing through a beautiful mineral strata of soft blue killas; several lodes we have seen, one of which we are driving on, and is composed of gossan, spar, and mudic, and is a very kindly lode.

## SILVER VALLEY MINING COMPANY.

July 14.—I beg to say that the old balance-bob bed is cleared out, and the foundation enlarged for the bed of masonry for the new balance-bob, which the masons will now commence building; and we are now clearing out the foundation for a bed of masonry for the bob at the south shaft, which we shall get ready for the masons, if possible, by the time the building at the north shaft is completed. We expect the heavy parts of the engine will be brought on the mine this week.

## J. RICHARDS.

## HAWKMOOR MINING COMPANY.

July 14.—I beg to inform you that Hitchins's shaft is 13 fms. 4 ft. below the surface. We are proceeding as fast as possible erecting the necessary work and machinery for sinking the western shaft.

## P. RICHARDS.

## CORNUBIAN MINING COMPANY.

July 14.—There is no alteration in the eighty-six fathom level, going east or west of Murray's engine-shaft, the appearances being much the same as reported on the 7th inst.; west of Murray's engine-shaft, Chiverton lode continues there to be worth about one ton of ore per fathom. The three pitches working there (at that level), west of eastern shaft, by eighteen men, are looking well, and turning out a fair quantity of rich work; the eastern end (eighty-six) is without alteration—lode about eighteen inches wide, yielding stones of ore. The tributaries working on the north lode at the seventy and seventy-eight fathom levels are working diligently, and most of them are earning wages in their respective tributaries.

## RICHARD ROWE.

## BEDFORD UNITED MINING COMPANY.

In the seventy fathom level east the lode is two feet wide, composed of spar, mudic, and ore—saving work. In the fifty-eight fathom level east there has been no lode taken down since our last; in the eastern winze, in the bottom of this level, the lode is two feet big, and worth 10f. per fathom. In the stopes west of western winze, in the bottom of this level, the lode is two feet wide, and worth 16f. per fathom. In the rise in the back of the forty-seven fathom level west the lode is two feet wide, composed of spar and ore, and worth 5f. per fathom. The men are still rising in the back of the adit level. At Ding-Dong there has been no lode taken down in Thomas's engine-shaft. At Wheal Tavistock the lode in Phillip's engine-shaft, and in the 25 fm. level west, is 24 ft. wide, producing saving work—altogether very kindly.

## J. PHILLIPS.

## FOREIGN MINES.

## IMPERIAL BRAZILIAN MINING ASSOCIATION.

## Current Prices of Stocks, Shares, &amp; Metals.

STOCK EXCHANGE, Saturday morning, Tuesday's close.			
Bank Stock, 2104 9114	Russian, 5 per Cent., 117 1 6	Spanish, 5 per Cent., 26 1	
3 per Cent. Reduced Anna, 90 1	ditto, 2 per Cent., 26 1 7	ditto, 3 per Cent., 26 1 7	
Exchange Mills, 54 56 per cent.	Brazil, 5 per Cent., 69 1 4	Chili, 6 per Cent., 99 101	
Peru, 5 per Cent., 99 1	Colombia, 6 per Cent., 17 1 8	Mexican, 6 per Cent., 36 1 7	
Dutch, 2 per Cent., 88 90	Persia, 6 per Cent., 33 1 2	Portuguese, 8 per Cent., 64 5	
Ditto, 4 per Cent., 99 1			

## SHARE MARKET.

**MINES.**—At the close of the week there has been rather more than usual business done in British mine shares during the past week, and a marked improvement has taken place in—Andrew and Nangiles, done at 100; Barristown at 320; Cardon United at 16; Condurrow at 20; South Cardon at 600; Wheal Seaton at 400; and Wheal Trelawney at 200; and we are assured that these have all been bona fide sales.

**RAILWAYS.**—At the commencement of the week the share market was unusually steady, with scarcely any change in prices; the settlement on Wednesday passed off in the most satisfactory manner, and but little business was done towards the close of the week—yet, upon the whole, that brisk spirit of speculation which characterised the market a few weeks since, appears, if not to be dying away, at least to be dormant, and a greater degree of caution evidently marks the conduct of buyers; prices, if anything, are in general a shade lower than quoted in our last. There has been little of importance to mark the proceedings in Parliament during the week—the Oxford, Worcester, and Wolverhampton is still the subject of investigation before the committee in the Lords, and the shares are something like 5 1/2 pm., while the Rugby, Worcester, and Tring shares still bear a premium of from 2 1/2 to 3. Notwithstanding the decision of the committee to the contrary, the evidence of every witness bears on the question of the gauge, and the evidence is now very strong in favour of the narrow. Mr. Hauseon (the agent at Birmingham of Messrs. Pickford), during the giving of his evidence, introduced a table, showing the proportion of the number of miles of each gauge, made, making, and projected, the result being 6 to 1 in favour of the narrow; the following are the details:—

	Broad.	Narrow.
Railways made	275	1844
" in progress	62	614
" projected	1311	5918

Total miles 1641 9376

The gauge commissioners have not yet entered on the examination of any witnesses, and as the session is now near its termination, it is probable no actual official investigation will be proceeded with until the re-assembling of Parliament, and this delay will not be productive of harm, but will give the commissioners the opportunity of storing their minds with many facts bearing on this important question, and making themselves acquainted with the details of the subject, before examining witnesses, whom we have no doubt will be selected from among the most scientific and practical men the kingdom can afford.

**JOINT-STOCK BANKS.**—Colonial, 15 1/2; London Joint-Stock, 15; London and Westminster, 27 1/2; Union of Australia, 26; Australian, 33; British North American, 48.

**MISCELLANEOUS.**—Equitable Revolutionary Society, 89 1/2; General Steam Navigation, 26 1/2; Peninsular and Oriental Steam Navigation Company, 73; Revolutionary Interest Society, 100.

**MESSRS. LAMOND'S SALES.**—The following are Tuesday's prices:—

**MINES.**—Condurrow, 17L; West Wheal Concord, 12L; Nister Dale Iron Company, 2L; Old Harrowbarrow, 1L; Lamarooch Wheal Maria, 4L; South Cardon, 550L; Great Wheal Martha Consols, 4L; North Wheal Providence, 2L 8s.; East Tincroft, 14L; Tamar, 8L; Tincroft, 10L; Calington, 29L; Trewavas, 45L; Santiago, 24L; Copiapo, 4L; West Holmehurst, 1L; Wheal Elizabeth, 4L; Cardon United, 14L.

**RAILWAYS.**—Caledonian Extension (2 1/2 L. pd.), 2L 9s. 6d.; Italian and Austrian (1L pd.), 2L 1s.; Whitehaven and Furness (1L pd.), 2 1/2 L; Grand Union (1L pd.), 1L 10s. 6d.; Great Western and Wycombe (1L pd.), 1L 1s.; Dender Valley (2L pd.), 2L; Paris and St. Quentin (2L pd.), 1L 15s. 6d.; Welsh Midland (2 1/2 L.), 3 1/2 L; Cornwall (3L pd.), 3L 16s. 6d.; Louvain and Jemeppe (4L pd.), 5L; Jamaica Junction (1L pd.), 4L; Dunstable, London, and Birmingham (1L pd.), 1L 19s.; Armathwaite, Coleraine, and Portrush (1L pd.), 1L; Durham and Sunderland (50L pd.), 24L; South Midland (22A pd.), 1L 13s.

**MISCELLANEOUS.**—Western Gas, 4L; Waterman's Steam-Packet, 1 1/2 L; Old Woolwich Company, 3L; Lancaster Canal (4L 6s. pd.), 42L; Bude Light Company (3L pd.), 17s.

The following are the prices realised on Friday:—Whitehaven and Furness (1L pd.), 2L; Direct Northern (2L pd.), 2L 17s. 6d.; Dunstable, London, and Birmingham (1L pd.), 2L 2s.; Shrewsbury, Worcester, and Chester (1L pd.), 3L 12s. 6d.; Eastern Counties (14L 16s. pd.), 2L 1L 9s. 6d.; South Midland (22A pd.), 2L 11s. 6d.; Manchester, Buxton, and Matlock (22A pd.), 5L; Orleans, Tours, and Bordeaux (4L pd.), 10L 6d. 6s.; Gt. North of France—Lafittes (4L pd.), 5L 4s. 6d.; ditto, Rosamé's (2L pd.), 2L 7s.; Over Yssel (4L pd.), 4L; Paris and Lyons—Ganneron's (2L pd.), 2L 7s. 6d.; Boulogne and Amiens (6L pd.), 10L 6d. 6d.; London and York (2L pd.), 4L; Indian General Steam Navigation Company (20L pd.), 20L; London and Coleraine (2L pd.), 3L 12s. 6d.; North Wales (1L pd.), 3 1/2 L.

**LEEDS, THURSDAY.**—If there be any one who doubts of the success of railways, event amongst the "agricultural mind," let him just notice the vast increase of traffic that has taken place in the receipts of those lines which have been in active operation during the past few years, during the course of the past spring, as compared with those that took place during the corresponding period of the year 1844, and then we think all his doubts will be at once dissipated. In no line has there been so marked an increase as in the triple alliance at Derby, in other words in the Midlands—viz., 57,000L; in the London and Birmingham the increase has been 52,000L; in the Great Western, 41,000L; in the Grand Junction, 30,000L; in the Brighton, 14,000L; and in the South-Western, 8000L. The total increase during the past six months has not been short of half a million; and what is equally remarkable, the gross amount of the spring receipts falls only 100,000L short of what it was last autumn, out of so large an amount as 2,900,000L in round numbers! Midlands continue in extremely good demand at 194 per cent., and the 40L shares firm at 30L; the meeting on the 25th will give a further impulse to prices. Great North of England are offering at the current prices, and buyers are not numerous; we have had no quotation as yet for the new 15L shares. Croydon and Brightons are breezy, the former at 22 1/2 L, and the latter at 77L; a considerable rise in both these stocks may be anticipated during the next three months. North British are on the move, and are very scarce in the market. Wakefield and Goole have risen 6L per share within the last few days; the evidence before the Lords is so favourable as to leave little doubt of the bill being got. Dewsbury are not strong at 19L per share, and will not, we think, go much higher, even if they maintain their present figure. West Yorks at 6L are much cheaper, in our eyes, than West Ridings at 7L; supposing that no arrangement is come to between the two companies, and the contest be renewed in the next session of Parliament, we regard the chance of the West York as at least equal to that of the Junction, and cannot, therefore, understand why one stock is at 5L premium on a 20L share, and the other only at 3L on a 50L share. Thirsk are heavy, in anticipation of a call; yesterday they were at 45L pm., to-day they have been more lively at 57s. pm.

R. B. WATSON, TOOTAL, & BARF.

**HULL, THURSDAY.**—We have had a firm, but not excited, market during the week. Midland 40L shares, Hull and Selby, old and halves, meet buyers at any prices below general quotations. This morning we have to note an improved demand for Leeds and Bradford, old and extensions; North Westerns and Wakefields, Pontefract and Goole, London and Yorks, and North British halves are also good.

**LONDON AND WINDSOR DIRECT RAILWAY.**—The inhabitants of Windsor promoters of this line, have had an unexpected refusal to their application for permission to pass through the Crown Lands. After a meeting called for the purpose, a few days since, a memorial was forwarded to the Commissioners of Woods and Forests, requesting permission for the railway to pass close to the Castle; an answer has been received, stating that, as it is considered highly injurious for a railway to pass in the way contemplated, the Commissioners would not trouble the deputation to leave Windsor for London, to submit the details of the project. The only way by which a line from London could reach Windsor, without touching Crown property, would be by Slough, and cross the Thames about one mile above Windsor-bridge.

**GREAT WESTERN RAILWAY AND KENNET AND AVON CANAL.**—An important negotiation is on foot between the executives of these two companies, being no less than the purchase by the Great Western Company of the Kennet and Avon Canal. Of the result of this negotiation there can scarcely be a doubt. The railway party will, of course, be glad to obtain the entire unopposed carrying trade of so large a district, and the canal company will be equally content at giving up a gradually falling off concern, open to the competition of a powerful rival.

## THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE

## COPPER ORES

Sampled July 2, and sold at Pearce's Hotel, Truro, July 17, 1845.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Wh. Maria	118	£20 1 6	West Cardon	52	£7 10 6
ditto	111	11 13 0	ditto	50	7 17 0
ditto	110	8 4 0	ditto	40	4 9 6
ditto	104	7 3 6	ditto	29	11 11 0
ditto	101	8 18 6	Politics	71	2 14 6
ditto	97	10 16 0	ditto	60	4 16 6
ditto	82	11 12 6	ditto	58	4 17 0
ditto	53	6 16 0	ditto	52	3 15 6
Treavean	95	4 4 6	ditto	51	5 15 0
ditto	86	5 7 6	ditto	39	3 12 0
ditto	71	3 7 6	ditto	22	5 12 0
ditto	68	2 9 0	Wh. Jewel	16	3 6 0
ditto	64	3 11 6	ditto	61	4 16 0
ditto	61	5 1 0	ditto	49	3 12 0
Wh. Lydia	117	5 10 6	ditto	35	8 10 0
ditto	91	6 2 6	ditto	30	5 10 0
ditto	52	2 15 6	ditto	25	6 3 0
South Towan	109	5 5 0	ditto	45	2 15 6
ditto	81	2 11 0	Holmbush	98	6 10 0
ditto	92	7 15 0	ditto	82	10 16 0
West Cardon	92	11 10 0	Bedford United	107	6 14 6
ditto	50	11 10 0	Wh. Maiden	78	4 18 0
ditto	54	12 0 6			

## TOTAL PRODUCE.

Wh. Maria	775	£7274 17 6	Wh. Jewel	226	£1149 8 6
Treavean	483	1931 3	Fowey Consols	290	1024 16 6
Wh. Lydia	458	2172 14 0	Holmbush	177	1503 2 0
South Towan	3	321	Bedford United	107	719 11 6
West Cardon	397	3560 2	Wh. Maiden	78	282 4 0
Politics	39	1570 4 6			

Average standard, 102L 7s.—Average produce, 9.—Average price per ton, 6L 9s. 0d.—Quantity of ore, 3271 tons.—Quantity of fine copper, 296 tons 1 cwt.—Amount of money, 21,308L 8s. 6d.—Average standard of last sale, 107L 15s. 0d.—Average produce ditto, 7s.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

	Tons.	Amount.
Mines Royal Company	193	£1341 3 6
English Copper Company	338	1476 7 9
Vivian and Sons	744	5204 8 6
Freeman and Co.	328	2615 6 9
Grenfell and Sons	768	3999 3 0
Sims, Willyams, Nevill, Druse, and Co.	321	2103 13 6
Williams, Foster, and Co.	577	4568 0 6
	3271	£21,308 3 6

TOTAL PRODUCE.

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Treavean	483	1931 3	Fowey Consols	290	1024 16 6
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South Towan	3	321	Bedford United	107	719 11 6
West Cardon	397	3560 2	Wh. Maiden	78	282 4 0
Politics	39	1570 4 6			



## SUPPLEMENT TO THE MINING JOURNAL.

## BIRKENHEAD AND HOLYHEAD JUNCTION, AND MOLD EXTENSION RAILWAY, WITH ITS BRANCHES.

Capital £100,000, in 50,000 shares, of £20 each.—Deposit £1 12s. 6d. per share.

EXECUTIVE COMMITTEE  
Chairman—CORNELIUS RANDALL, Esq.  
Vice-Chairman—JOHN PINCH, Jun., Esq.  
Charles D. Archibald, Esq.  
William Byrom, Esq.  
James Duncan, Esq.

Wm. Newton, Esq.

Thomas Jenkins, Esq.  
John Little, Esq.  
Sir William Magnay, Bart.

## PROVISIONAL COMMITTEE.

Charles D. Archibald, Esq. F.R.S., F.S.A., &c. York-terrace, Regent's-park, and Walney, Ulverston, a director of the Great North and South of France, Tean and Dove Valley, and Furness and Windermere Railways, a deputy-lieutenant of Lancashire.  
James Thomas Bourne, Esq. Liverpool  
William Byrom, Esq. Oldham  
William Cox, Esq. Spondon, Derbyshire, a director of the Derby and Crewe, and Tean and Dove Valley, and Eastern and Western Junction Railways  
Samuel Walker Cox, Esq. Bransdale Lodge, Derbyshire, a director of the Tean and Dove Valley, and Eastern and Western Junction Railways  
Richard Congreve, Esq. Burton Hall, Cheshire  
J. H. Campbell Dicker, Esq. New Hall, Neston, Cheshire  
Thomas A. Dale, Esq. Hamilton-square, Birkenhead  
Sir Richard Dobson, F.R.S. 47, Gloucester-place, Portman-square, London  
James Duncan, Esq. Liverpool  
J. Formby, Esq. Formby Hall, Lancashire, and Newhouse, Hoylake, Cheshire  
John Finch, Jun. Esq., and Edward Finch, Esq., of the firm of Messrs. John Finch and Sons, iron-merchants, Liverpool  
Joseph Gillham, Esq. Hargreaves House, Oldham  
George Gradwell, Esq. Preston, a director of the Liverpool, Ormskirk, and Preston, and Preston and Newcastle Railways  
Thomas Jenkins, Esq. Liverpool, and Venalit Iron-works, and Blaenavon, Venalit, and Forthgoch Collieries, a director of the Great Eastern and Western Railway  
John Little, Esq. Derby House, Manchester  
Sir Duncan MacDougall, 94, Eaton-square, London  
Sir William Magnay, Bart. alderman, and late Lord Mayor of London, a director of the Great North and South of France Railway  
William Newton, Esq. Dawson, Heswall, Cheshire  
John Ormskirk, Esq. Flint  
Jephtha Pacey, Esq. Cheadle Hill, Manchester  
Samuel Perrott, Esq. Liverpool  
James Baillie Pender, Esq. Edinburgh, a director of the Edinburgh and Peebles Railway  
Cornelius Randall, Esq. Manchester, a director of the Sheffield and Manchester and Huddersfield and Manchester Railways  
William Robinson, Esq. Lancaster, a director of the North Western Railway  
Frederick Ramden, Esq. Seymour House, Old Trafford  
William Sharp, Esq. Linden Hall, Lancashire, a director of the North Western Railway  
George Tell, Esq. Albert-road, Regent's-park, London  
John Thompson, Esq. Wigan, and Firds Iron-works, near Wrexham  
John Tomkinson, Esq. Liverpool  
Edward D. de Vite, Esq. Lancaster, a director of the North Western Railway  
Sir William Young, Bart. 7, Westbourne-street, Hyde-park-gardens, London, a director of the Honourable East India Company  
(With power to add to their number.)

## ENGINEERS.—Messrs. Gaskell and Brunton, Birkenhead.

SOLICITORS.—Messrs. Rowley and Taylor, Manchester  
W. Sharp, Esq. 2, Verulam-buildings, Gray's-inn, London  
J. S. Porter, Esq. Birkenhead

## BANKERS.

Union Bank of Manchester  
Union Bank of Liverpool  
North and South Wales Bank, Birkenhead  
Messrs. Cunliffe, Brooks, and Co. London

## PROSPECTUS.

This line of railway commences at the docks forming at Birkenhead, and proceeding from thence by or near to Bidston, Moreton, Hoylake, West Kirby, Thurstaston, Heswall to Parkgate, it strikes across the River Dee to Flint, where it forms a junction with the Chester and Holyhead Railway, from whence it is carried to Mold along the valley of the Conwy Brook.

From the main line it is proposed to form two branches, one diverging therefrom at Wallasey to New Brighton; another from some convenient point at or near Parkgate or Neston, to connect itself with the Birkenhead, Manchester, and Cheshire Junction Railway, at or near Little Sutton.

Upon the importance of providing a direct railway communication between the manufacturing districts of Lancashire, the large commercial town of Liverpool, and the town of Birkenhead, rapidly rising to eminence, and the rich mineral district of North Wales, and the port of Holyhead, little need be said to recommend to the public a line of railway having for its object these great advantages. This line of railway has, therefore, been projected not only with the view of supplying the cheapest, most direct, and best means of communication between the ports of Holyhead, Birkenhead, and Liverpool, but also for the purpose of affording a ready means of transit and shipment for the produce of the great coal-fields, and rich mineral districts of North Wales, now entirely devoid of railway communication.

By means of this line of railway, a considerable reduction of distance, to the extent of eleven miles on all existing and projected lines, and a consequent saving of time and expense, will be effected between Holyhead, Birkenhead, Liverpool, and the manufacturing districts of Lancashire, and this coupled with the fact of the terminus of the line adjoining the new docks forming at Birkenhead, and thereby materially lessening the cost of transhipment of merchandise cannot fail to make it the cheapest and most preferable medium for the conveyance of passengers and merchandise between these ports.

To the towns of Mold, Flint, Bagillt, Holywell, and the districts surrounding them, this undertaking must ensure the most incalculable advantages by opening, to their rich mineral productions, a ready and cheap access to the important markets of Liverpool, Birkenhead, and Manchester; and, on the other hand, great benefit will accrue to these markets by the conveyance thither of iron, copper, lead, zinc, slate, coal, and lime, at a very moderate cost. Should this line of railway be formed, the promoters feel confident that the articles of coal and lime alone, of which the consumption is very great, would yield a very large and profitable return on the capital to be invested; coal could be delivered in Birkenhead, or shipped in the Mersey at one-third less price than it is now sold at, and lime, which is now selling at 20s. per ton at Birkenhead, after paying an ample return for its conveyance, could be delivered at 12s. per ton.

With respect to the passenger traffic likely to come upon this line of railway, it is sufficient to state, that it will form a portion of the high road for travellers between Liverpool, Lancashire, and Ireland; and in addition thereto a considerable accession of traffic may fairly be reckoned upon from persons visiting the delightful and picturesque Vale of Llywod and the grand and mountainous scenery of North Wales; as also by rendering to the inhabitants of Liverpool, Manchester, and the manufacturing districts of Lancashire, an easy access to those much favoured and delightful watering-places—Parkgate, Hoylake, Rhyd, &c.

The branch line from Parkgate or Neston to join the Birkenhead, Manchester, and Cheshire Junction Railway, at or near Little Sutton, also forms a most important feature in the undertaking, as by that means a direct communication will be opened between Manchester and the manufacturing districts of Lancashire, North Wales, and Holyhead.

Off Hible the channel is deep and easy of access. The late Mr. Telford, in a survey that he made of the River Dee, gave it as his opinion that it was the place most eligible for a harbour. Should it be deemed desirable hereafter to construct a dock and harbour of refuge at this place, a branch line may be formed, which would connect it at once with Birkenhead and Liverpool.

By following the coast line from Birkenhead to Parkgate but a small outlay will be required for the formation of the railway, and indeed the engineering works of the whole line are very slight, with the exception of the crossing of the River Dee, from Parkgate to Flint, and this part of the undertaking requires a more detailed notice.

It is proposed to cross the Dee from Parkgate to Flint, where the river forms its estuary into a narrow channel, at or near the last-mentioned place; the rest of the distance between the Welsh and Cheshire coast being a large sandbank, seldom wholly covered by the sea, even at high water, and at low water passable by persons on foot. This crossing will be effected without difficulty, either by means of an embankment or by a viaduct upon piles, which ever mode may be considered the more advantageous to the company; but should arrangements be made with parties having existing interests in the land to be reclaimed, the former mode will be adopted. It is contemplated to extend the present new channel formed by the River Dee Company from Connall's Quay to Flint, to form at Flint a tidal basin, a spacious locks, and weirs, and to carry the railway across these locks by means of swing bridges, and thus, at a very trifling cost, upwards of 5000 acres of land will be reclaimed, and a continuous and uniform depth of water and means of constant communication will be kept up between Chester and Flint for vessels of a large burden. The line of railway will not interfere with any park like or other ornamental grounds.

No detailed estimates of traffic have yet been taken; but the promoters are in possession of sufficient statistics to say that, looking at the various sources of traffic as above detailed, which must necessarily flow upon this line, they may with confidence anticipate that a return of at least 8 per cent. may be fairly expected on the outlay.

It may be well to state, that, in estimating the cost of this railway, no deduction has been made on account of the great value of the land to be reclaimed from the Dees; this must necessarily be a matter for after arrangement.

Means will be taken to obtain an Act of Parliament in the next session, with the usual clauses for restricting the liability of each shareholder; and it is proposed to allow interest on the paid-up capital.

Applications for shares to be made in the subjoined form to the solicitors for the company, or to Mr. W. G. Seed, sharebroker, Spring-gardens, Manchester, and Messrs. Fletcher and Sharp, sharebrokers, 14, Exchange-buildings; and Mr. G. A. Brown, sharebroker, Drury-court, Dale-street, Liverpool.

## FORM OF APPLICATION.

To the Provisional Committee of the Birkenhead and Holyhead Junction and Mold Extension Railway, with its Branches.

Gentlemen.—I request you will allot me shares, of £20 each, in the above undertaking, and I hereby agree to accept such shares, or any less number which may be allotted to me, and to pay the deposit thereon, and also to execute the Parliamentary contract and sub-subscribers' agreement when required to do so.

I am, gentlemen, your's, &amp;c.,

Name in full .....  
Profession or trade .....  
Residence .....  
Reference .....  
Date. ....

BIRKENHEAD AND HOLYHEAD JUNCTION, AND MOLD EXTENSION RAILWAY, WITH ITS BRANCHES.—Notice is hereby given, that NO APPLICATION FOR SHARES in this company will be received after FRIDAY, the 26th inst., immediately after which the allotment will be proceeded with.

By order, ROWLEY &amp; TAYLOR,

Solicitors to the Company.

## DUTCH RHENISH RAILWAY, FROM AMSTERDAM AND ROTTERDAM, THROUGH Utrecht TO ARNHEM, AND THE PRUSSIAN FRONTIER, NEAR EMMERICK.

Capital 24,000 florins, or £2,000,000, in 100,000 shares, of 240 flor., or £20, each.

## MEMBERS OF THE GENERAL DIRECTION.

PRESIDENT—His Excellency GERARD Counte SCHIMMELPENNINCK, Minister of State, Commander of the Order of the Netherlands Lion, Member of the First Chamber of the States General, Hague

His High Mightiness Edmond William Van Iselt, Chevalier of the Military Order of William, Commander of the Order of the Netherlands Lion, Member of the Second Chamber of the States General, Rotterdam

His High Mightiness Peter Huidkoper, Commander of the Order of the Netherlands Lion, Member of the States for North Holland, Burgomaster of Amsterdam, Amsterdam

Abel Lewes Gower, Esq. London

The Noble Signor Peter Ariens, Chevalier of the Military Order of William, Commander of the Order of the Netherlands Lion, Chevalier of the Order of St. Anne, and of the Sword of Sweden, Vice-Admiral, Adjutant to his Majesty the King of the Netherlands, Hague

The Noble Signor J. G. W. Merkes Van Gendt, Chevalier of the Order of the Netherlands Lion, Officer of the French Legion of Honour, Chevalier of the Order of St. Anne, Adjutant to his Majesty the King of the Netherlands, Major in the Engineers, Hague

His High Mightiness Abram Van Ryckevorsel, Chevalier of the Order of the Netherlands Lion, ex Member of the Second Chamber of the States General, Member of the Municipal Council and of the Chamber of Commerce of Rotterdam, Commissioner of the Netherlands Trading Company, Rotterdam

Chas. Devaux, Esq. Director of the Amiens and Boulogne Railway Co., London

Frederick Ricketts, Esq. Chairman of the Bristol and Exeter Railway, London

His High Mightiness Jan Jacob Adolphe Baron Van Pallandt, Chevalier of the Order of the Netherlands Lion, Member of the States of Guelderland, Burgomaster of Arnhem, Arnhem

The Noble Signor J. Frederick Hoffman, Chevalier of the Order of the Netherlands Lion, Member of the Provincial States of South Holland, Burgomaster of Rotterdam, Rotterdam

The Noble Signor Nich. Peter Jacob Klen, Chevalier of the Order of the Netherlands Lion, Member of the Provincial State of Utrecht, Burgomaster of Utrecht, Utrecht

The Noble Signor Peter H. Tromp, Deputy-Burgomaster of Rotterdam, Rotterdam

The Noble Signor Jacob Van Gameren, Chevalier of the Order of the Netherlands Lion, Vice-President of the Provincial Court of Guelderland, Arnhem

The Noble Signor Louis Van Mesritz, Chevalier of the Order of the Netherlands Lion, Ins. Factor-General of the Treasury of the Kingdom, Administrator of the Domains of His Majesty the King of the Netherlands, Hague

Thomas Wilson, Esq. Chevalier of the Order of the Netherlands Lion, Haarlem

John Masterman, jun. Esq. Director of the Northern and Eastern Railway, London

John Moss, Esq. Chairman of the Grand Junction Railway, Liverpool

The Noble Isaac James Rochussen, Chevalier of the Order of the Netherlands Lion, Registrar of the Tribunal of Amsterdam, Amsterdam

M. G. C. Bosch Reitz, Amsterdam

The Noble Signor David Abraham Portielje, Advocate and Judge of the Tribunal of Commerce at Amsterdam, Amsterdam

(With power to add to their number.)

## DIRECTORS IN HOLLAND.

M. Leon Jean Enthoven, Chevalier of the Order of the Netherlands Lion, Hague

John W. Wilson, Esq. Haarlem

M. Louis Splitgerber, Amsterdam

M. Leo Lippmann, Consul General for the Grand Duchy of Luxembourg, Amsterdam

M. Arnold Kooy, Amsterdam

M. Fred. Corneille Zilles, Chevalier of the Military Order of William, Amsterdam

M. Van Oostveld, Chairman of the Cadastre, Arnhem

M. Ch. G. Schutze Van Houten, Rotterdam

## DIRECTORS IN LONDON.

William James Chaplin, Esq. Chairman of the South-Western Railway Company

Henry John Enthoven, Esq.

Matthew Uzzell, Esq. Director of the South-Western Railway Company

Gregory Seale Walters, Esq.

## COUNSEL AND SOLICITORS IN AMSTERDAM.

Mr. S. P. Lipman, Chevalier of the Order of the Netherlands Lion, and of the French Legion of Honour; Mr. H. A. Hartog.

## COUNSEL AND SOLICITOR AT THE HAAG.

Mr. P. S. Schooneveld, Member of the States General, and Chevalier of the Netherlands Lion.

Solicitors in London—Messrs. Crowder and Maynard.

Bankers in London—Messrs. Masterman, Peters, and Co.

Bankers in Liverpool—Messrs. Moss and Co.

Bankers in Amsterdam—The Associate Cassa.

Consulting Engineer—Joseph Locke, Esq.

## SECRETARY IN HOLLAND.

M. Jean Charles S. Jacob, Secretary of the Chamber of Commerce, Amsterdam.

## SECRETARY (PRO TR.) IN LONDON.

Ed. Alm, Esq., No. 62, King William-street, City.

London, July 11, 1845.

The grant of this important line of railway was made to the concessionaires by conventions, dated the 16th of May last, duly signed between them and his Excellency the Minister of the Interior, ratified by His Majesty the King of the Netherlands, and gazetted on the 20th of the same month.

Its entire length will be about 163 miles, of which twenty-two miles (from Amsterdam to Utrecht) were opened in December, 1843, and a further length of thirty-six miles (from Utrecht to Arnhem) on the 14th of May last, leaving still to be completed the portion from Rotterdam to Utrecht (thirty-one miles), and from Arnhem to Emmerick (twelve miles), with two miles of branch lines to the Entrepot Dock at Amsterdam and the river at Rotterdam.

The duration of the grant is for about fifty-three years, terminable at the close of 1898, at the expiration of which period, it is to be renewed for twenty-five years, and so on for every succeeding twenty-five years, unless the Government give notice of their intention to take it into their own hands, in which case the entire cost of construction, including land, and also any outlay for improvements and additions which may hereafter be made, are to be repaid in full. The whole of the working and other stock is to be taken at a fair valuation—thus rendering unnecessary any sinking fund to replace the capital. The Government have no power to repossess it until the year 1898.

There will be no gauges on this railway, and it will be at bat level, except for about three miles in ascending to Arnhem, where the steepest gradient is only 1 in 300. The broad gauge of 6 feet has been adopted. The whole portion of the line hitherto made, including stations and working stock, has been executed in a very superior manner, under the able direction of the chief Government engineer of the Posts and Telegraphs in Holland.

The tariff, both for passengers and for goods, is higher than in Belgium or in France, and the wealth and general habits of comfort of the Dutch people are found to produce a much larger proportion of first and second over third class passengers than in those countries.

The railway will have for its two western termini the densely populated and rich trading cities of Amsterdam and Rotterdam, and will traverse provinces containing 1,520,000 inhabitants. Some idea of the extent of the local passenger traffic may be derived from the fact, that 300,000 passengers were conveyed, in 1842, between Amsterdam and Utrecht (the portion then opened), whilst the receipts upon the same portion have nearly doubled during the corresponding months of the present year, and a considerable augmentation will now be realised, as the line is open to Arnhem, the favourite resort of the wealthy inhabitants of Amsterdam and Rotterdam. The imports into Amsterdam and Rotterdam amounted in 1842 to 945,720 tons, and the exports to 586,675 tons, and their East and West India trade alone employed 320 large vessels.

Of this immense goods traffic a large proportion must come upon this railway, in consequence of the long and frequent stoppages to which the canal and river navigation is constantly subject from frost in winter, and the want of water in summer, whilst the unusually good gradients of this railway will enable it to carry goods at a low rate, and all the expenses of loading, carting, unloading, &c., will be saved, by its having a branch line to the water's edge at the river at Rotterdam, and to the docks at Amsterdam, so as to load and unload goods direct from or into the vessels and railway wagons.

It will be seen, by reference to the map, that, by means of this line and of the Over Yssel Railway, which joins it at Arnhem, a direct and unbroken railway communication will be established from Amsterdam, Rotterdam, The Hague, and Utrecht, to the North of Holland, and thence, by the various German railways, to the interior of Europe, embracing the important populations of Hanover, Brunswick, Prussia, Austria, Bavaria, Saxe, and the other German states; and the great capitals and commercial cities of Berlin, Vienna, Munich, Dresden, Leipzig, Hamburg, Danzig, Magdeburg, Stettin, Frankfurt on the Oder, Münster, &c. The south of Germany, Switzerland, Italy, and the Mediterranean, will also have a direct railway connection with the capital and principal towns of Holland by means of the branch line which this railway will have from Arnhem to Emmerick, whence another continuous line is to join the Great Rhenish Railway to Cologne, Frankfort-on-the-Main, Carlisle, Baden, &c.

By the arrangements which have been made, the concessionaires transfer the railway to this company for the sum of £1,895,317 7/2 florins (somewhat under £1,000,000 sterling), being the amount actually expended in its construction, including the interest paid upon the capital employed, but giving credit for the receipts during and subsequent to its construction, as ascertained by commissioners appointed under a Royal commission, dated October 22, 1844. Of this sum 9,000 florins were raised by loan, as will be presently noticed.

The concessionaires have paid a deposit of 500,000 flor



## RAILWAY GAZETTE.

## PILBROW'S ATMOSPHERIC RAILWAY.

The large model railway on this system, which has for some weeks been preparing at the Adelaide Gallery, is now completed, and was on Thursday last exhibited to a select number of the nobility and others, connected with the scientific world, and interested in the success of this system. The railway is about 112 feet long, and of sufficient width to allow a carriage, capable of holding one person, to travel on its rails; at one end is a gradient of one in eight, and the atmospheric tube, which is three inches in circumference, is laid only about one-third of the length at the opposite end, terminating in a receiver connected with the air-pump, which is worked by the steam-engine at the other extremity of the apartment. Since the system was first made public, a number of alterations and improvements have been made in the mode of transferring the power from the travelling piston to the carriage, and the plan on which the present model is constructed, completely sets aside many of the objections which have been made to the system. The tube is constructed circular for the piston, with a square chamber above, along which the piston-rack passes, moving the wheels of the spindles in its progress. At regular intervals of three feet (they will be thirty feet in practice), are fixed two small perpendicular shafts, working in brass bases in the top of the tube, and which are air-tight; on the ends of these are pinions, whose teeth are not parallel with the axis, but partake of the form of endless screws; attached to the travelling piston is a rack, the teeth of which correspond with the pinions and form an angle with the horizon of about forty-five deg., this rack is of just sufficient length to move two pairs of shafts and pinions, so as always to enter one pair before leaving the last; connected with the under part of a power carriage (as the leader of a train would on this plan be called), is a rack in every respect similar to the one attached to the piston in the tube, which, being placed in connection with two pairs of pinions exactly over that rack, the momentum of the latter is transferred through the shafts and pinions to the one above, and the carriage and train is thus propelled to a considerable distance beyond the end of the exhausted tube. The experiments were highly successful; the exhaustion was generally continued, until the mercury indicated a pressure of twenty-four and a half inches, or about seven pounds on the square inch, when the seat in the carriage was occupied by one of the ladies present; the valve connecting the tube with the exhausted receiver was then opened, and the carriage started off with the most admirable ease and rapidity, as stated above, receiving its last impulse when it had two-thirds of the distance to travel, and that up a gradient of one in eight; notwithstanding which, we believe, on every occasion, the buffer struck the block at the terminus. Dr. Hewlett, on being requested, kindly gave a short description of the advantages of the system, which he pointed out by the aid of large diagrams, and which, he stated, were the absence of all loss of power from leakage, in consequence of the absence of the lateral opening and continuous valve—the pipe being buried prevented this leakage, as well as all obstruction; he showed, also, that roads could be crossed on a level in the same manner, as by the common railway, and that a line on this principle could be laid down at about one-third less expense. So confident are the directors of its capabilities in ascending steep gradients, that having been applied to the executive of a railway at Altona, to know if they would undertake to work a gradient of one in six, they immediately expressed their perfect readiness to do so, and, we understand from good authority, that the specifications have been received and estimates sent. Among the company present, we noticed the Marchioness of Westmeath, Lady Stafford, Lady Barton, Marquis of Douro, Earl Bessborough, Earl of Mornington, Ashton Smith, G. B. Bolton, and J. F. Lambert, Esq., and many others of distinction, whose names we could not ascertain. The model will now be open to the public, and will no doubt cause much interest.

## PROGRESS OF RAILWAYS IN FRANCE.

[FROM OUR PARIS CORRESPONDENT.]

On Friday the Committee of the Chamber of Peers presented its report in favour of the laws for according embranchments from Dieppe and Fecamp to the Rouen and Havre Railway, and from Aix to the Avignon and Marseilles Railway; and, on Monday, those laws passed the Chamber without amendment, and without discussion. The concession of the Dieppe and Fecamp lines is to be for the same period as that of the Rouen and Havre line, which expires in June, 1841—a long time to look forward to; but the company has, in return for so long a concession, to execute the lines at its own expense, without any subvention whatever. The cost of the Dieppe line is calculated to amount to 12,400,000 f. (492,000/), and the Fecamp line (not yet fixed upon) to less. They are expected to yield a reasonable, though not extravagant, profit. Dieppe is a town of some importance, and, when the railroad is finished, will, no doubt, obtain a large share of the traffic that takes place between London and Paris. Fecamp is also of some mercantile importance, and carries on considerable trade with Newcastle-upon-Tyne. The company to whom these two lines are conceded is independent of the Rouen and Havre Company, but, as the interest of the two concerns are in some measure identical, it is not impossible, as they are, and have solemnly promised to remain, on the most friendly terms, that a marriage may eventually take place between them. The embranchment on Aix is conceded to, and must be executed by, the Avignon and Marseilles Company, for a period not exceeding forty-five years. The expense of the line is estimated at 4,300,000 f. for a single line of rails, and the corporation of Aix gives a million francs towards that sum. These embranchments are conceded, you will perceive at once, to companies, contrary to the principle so solemnly and so faithfully laid down by the Chamber of Deputies, three years ago, of letting the Government form the lines, and then put them up for adjudication by public competition—a system which is not advantageous to the state, and which, by encouraging Stock Exchange gambling, causes the ruin of hundreds.

On Friday, the Chamber commenced the discussion on the Paris and Lyons Railway Bill. The Comte Dain, in a long speech, recommended the postponement of the bill, on the ground that it was dangerous to throw so many railway schemes upon the market all at once; but the Chamber paid little respect to the entreaty of the Comte. In fact, it would have been madness if it had; for France is so disgracefully behindhand in railway communication that, instead of postponement, she ought to work away day and night. Besides, as the Minister of Public Works represented, a postponement would have had the effect of driving English capitalists away from France; for, after having waited as they have, it is not likely they would have consented to allow their capital to remain idle for another year, when they can employ it with so much advantage in Belgium, in Germany, in Italy, and even in Spain. After a lengthy discussion, in which a multitude of points were touched upon, the law was passed without amendment. It authorises the Minister of Public Works to put up to public adjudication the Paris and Lyons line, for a period not exceeding forty-nine years, and the Lyons to Avignon, with an embranchment on Grenoble, for not more than fifty years. The former would be of immense importance, if it only united Paris with the greatest mercantile city of the kingdom, Lyons; but it goes through rich, productive, and populous countries, and serves many important towns, among which are Melun, Montereau, Sens, Joigny, Tonnerre, Ancy-le-Franc, Montbard, Dijon, Beaune, Chalon-sur-Saône, Mâcon; and the line to Avignon is also of great importance. From Paris to Lyons the distance is 516 kilometres; from Lyons to Avignon, 236; the embranchment on Grenoble, 96—total, 848. The works are scarcely begun on any part of the line, except between Dijon and Chalon, where they are far advanced. The great tunnel at Blaizy is being pushed forward actively, but it has not yet made great progress. The whole line, it is expected, cannot be opened for six, or, at the least, five, years, though parts of it may be brought into use long before.

The committee of the Chamber of Peers, appointed to examine the *projet de loi* on the Tours to Nantes, and Paris to Strasbourg Railways, presented its report to the Chamber on Monday. It was said, that there was a division in the committee, four members advising the postponement of the law to next session, four opposing it, and the president being neutral; but it appears from the report itself, that this statement was entirely untrue, for the report strongly recommends that the law shall be passed in the course of the present session, and it proposes no amendment whatever. The duration of the concession on the Tours to Nantes line is fixed, at the outside, at thirty-five years, which will be lessened by the competition, when the adjudication takes place. The works throughout the line are proceeding with great activity, and it is expected, says the committee, that the line may be completed in about three years time. The *Journal des Chemins de Fer*, however, asserts that the line can be ready for circulation towards the end of the next summer; but this, I think, is a mistake.

The line is 195 kilometres in length, and it serves the large towns of Samur, Angers, Ingrande, and Ancenis. I will not weary you by going into details of figures, for, to make them comprehensible, they would occupy considerable space; but, I may state, that, from the calculations that have been made, the company that may possess the adjudication, after complying with all the conditions imposed upon it, will receive an interest of 7½ per cent., which will allow 6 per cent. to be divided among the shareholders, and 1½ per cent. for the *amortissement*. With respect to the line to Strasbourg—from Paris to Strasbourg the distance is 495 kil.; there are embranchments on Rheims and on Metz 87 kil., and a further embranchment from Metz to Saarbrück of 75 kil.—making the total for the whole line, 661 kil. The great line, from Paris to Strasbourg, will be executed by the Government, the company laying down the rails, and finding the *material* for working, but the embranchments will have to be executed entirely at the expense of the company. According to the committee of the Chamber of Peers, the outlay of the company will be 125,000,000 f.; the receipts are estimated at 16,000,000 f., and the profit 7 per cent., of which 6 would be for the shareholders, 1 for the *amortissement*. The line and embranchments would be conceded for forty-five years. The works are scarcely begun on any part of the line, and, it is considered, they cannot possibly be completed in less than four or five years. The Paris end will probably be finished first, measures having been already taken for having it commenced without delay. The *projet de loi*, relative to these railways, is the only railway project upon the orders of the Chamber of Peers. It was set down for discussion to-day; but as the Budget precedes it, it is not likely that it can be taken into consideration before Friday or Saturday.

I have heard it said, that the Minister of Public Works has promised that the adjudication of the Northern Railroad shall take place on the 5th Sept., but no official announcement to that effect has appeared. I do not see what objection there can be to the adjudication taking place a month earlier. All the companies, I believe, or nearly so, that intend to compete for it, have closed their subscription lists, and Rosanel's company (and, if I mistake not, another also), have received the money subscribed in England, and are prepared to lodge the amount required as a guarantee (15,000,000 f., or 600,000/), at a day's notice. Considering the intense anxiety that exists, as to the adjudication of this railway, and the large amount of money it keeps locked up, I think the Minister of Public Works is bound to adjudicate it with the least possible delay. It is but just to him to say, as far as I can judge, from the announcements in the *Moniteur*, that he is hastening the completion of the line as much as lies in his power; but as, do what he will, the adjudication must take place before the line be entirely finished, what does it matter if it be a little more or a little less advanced? True, the company will have to disburse an immense sum, immediately on the adjudication taking place, and it will lose the interest for a certain time on that sum; but, then, it will be able to hasten the opening of the line, so that what it is out of pocket one way it gains the other. Besides, the interest is not much to the shareholders, for it is swallowed up in expenses; and there is one banker, who coolly proposes to put all the interests in his own pocket. On every account, then, any delay, even a single day's, in the adjudication, that is not absolutely unavoidable, is deeply to be deplored, for the sake of the companies, and will bring on the Minister

strange censure.—Paris, July 16.

## RAILROADS IN SPAIN.

Sir,—Truth, whether it be in or out of fashion, is the measure of knowledge, and the business of the understanding; whatsoever is besides that, however authorised by consent, or recommended by rarity, is nothing but ignorance, or something worse."

I am, perhaps, by giving publicity to the following, pursuing a thankless and bootless duty, in again begging my countrymen to "mark, learn, and inwardly digest," the chances of there being anything like a probable return or security for the capital which may be called for to construct a railroad from Aviles to Madrid; be that as it may, I propose to the consideration of the shareholders the following inquiries:—

1. Whether Aviles be a good port or not; if it be, then, what accommodations does it afford—and, if it does not afford the requisite accommodations, what will be the cost of constructing them?

2. What are the difficulties which will be met with in taking the road across the ridge of mountains which divide the Asturias from Castilla, and what rivers the road will meet with in its course, and what would be the additional costs of such a line as compared with other railroads?

3. As to the certainty of the Spanish Government permitting the importation of rails, steam-engines, and the multitude of other things that may be required?

4. What security can be offered that malicious persons will not be tempted by political, interested, or other bad intentions, from destroying a portion thereof, and thereby render it awfully dangerous?

5. Whether the shareholders have obtained, from indisputable sources, the revenues which may be gotten from passengers and transit thereon?

6. What will be the time and cost of steamers plying across the Bay of Biscay, particularly, say, from October to the end of March?

7. What would be the difference to passengers in time, comfort, and expense, between the following routes—viz., from London, by steam, down the Thames, the Channel, and across the Bay of Biscay to Aviles, and from thence to Madrid; or by railroad from London to the coast, across the Channel by steam, and then by railroad to Bordeaux, or by other railroads that may pass through France to or near the Pyrenees, and from thence to Madrid by diligence, or by a railroad which may ultimately pass from Victoria or other places to Madrid?

8. As to the facilities which will be offered by the projected Central line, which will pass from Lisbon to Madrid?

I do not know what has lately appeared in your or other English papers, as connected with railroad speculations—consequently, I may be suggesting considerations which might have been already thoroughly gone into by the English capitalists; still, I am confident, that no *bonâ fide* shareholders will disregard the foregoing queries, as they are written solely for the purpose of inducing them to well consider the prudence of a further outlay, and thereby, perhaps, recover a portion of their paid-up capital.—Repeat what is past, avoid what is to come."

## A RESIDENT IN THE ASTURIAS.

P.S.—I cannot help thinking that a line of railroad through France will ultimately form the great artery of communication to and from Spain, and, consequently, be the most expeditious and economic route for English passengers. I am informed that there are persons making calculations as to transit, and therefore, the foreign speculator will, I believe, be enabled to gain the information which he suggested in his communication to you. If these facts are got at, and well laid before the public, the little wasps will no longer annoy him, but otherwise he will be sure to have a "hornet's nest" about him.

LIVERPOOL, MANCHESTER, AND NEWCASTLE-UPON-TYNE JUNCTION RAILWAY.—A number of highly influential landowners and merchants connected with the northern counties, and the commerce of the great towns of Liverpool, Manchester, and the coal districts of Durham and Northumberland, are the promoters of this company, the object being to form a direct line of communication from the several ports on the north-east coast of England, with Liverpool, Manchester, Blackburn, Bolton, Clitheroe, and the other large towns of Lancashire and Yorkshire. The population of the districts which will thus be brought into communication may be safely taken at 2,240,000, and the great and increasing trade at the ports of Shields, Middlesburg, Tynemouth, Sunderland, Seaham Harbour, Hartlepool, Stockton-on-Tees, and others, fully warrants the construction of such a line of railway, which will bring Newcastle upon-Tyne forty miles nearer to Liverpool than any existing railway route. Coals, which are the production of a large extent of country at both its termini, will, by its means, be transported to all the intermediate towns, and, by reducing their price in the West Riding of Yorkshire full 40 per cent., secure a large traffic in that article alone. The several mineral products of the districts to be traversed, such as slate, lead, ironstone, freestone, and lime—form important elements of trade—and with cattle, and the great agricultural produce of Durham and Yorkshire, supply a goods' traffic, which alone might fairly be anticipated to make a profitable return; but, when to this is added the large passenger traffic which must ensue to a line traversing the densely-populated and wealthy districts through which this line will run, it is clear that a large return will be made for the capital expended. The line will commence at Preston, and proceed by the Valley of the Ribble to Clitheroe, where it meets the proposed extension of the Blackburn and Bolton line, from thence it proceeds direct to Settle and Hawes, and by the Valleys of the Wharfedale and Ure to the towns of Askrigg and Richmond, forming a junction near the latter place with the Great North of England and the Newcastle and Darlington Railways. Its entire length will be about seventy-five miles, no difficulties of any magnitude exist in its construction, and it is estimated that the capital, which is fixed at 2,000,000/., will be more than sufficient for the entire and permanent completion of every portion of the works. It may also be added, as another important feature, that the proposed line has the full support of Mr. G. Hudson, as connected with the great northern lines.

LONDON AND BIRMINGHAM EXTENSION RAILWAY.—This line of railway, which will be little over thirty miles in extent, is intended to bring into more direct communication the extensive and populous towns of Northampton, Daventry, Leamington, and Warwick; the two latter towns, containing nearly 24,000 inhabitants, are at present approached from Northampton and the east by the circuitous route of the London and Birmingham line to Coventry, and from thence by a branch of seven miles to Warwick. This line will cause a saving in time and distance in this particular of at least one-half; it will also prove the most direct line from London to Warwick, through Daventry and Leamington—the latter favourite watering-place being visited by thousands during the summer months, who have no fixed residence there, will alone draw a large passenger traffic on to this railway. There are at least 63,000 persons residing within the localities, which this short railway will accommodate—a number which cannot fail to bring a large traffic to the line, and its peculiar situation connecting it with the large central lines, with the east coast, and with Wales, a large goods' traffic in coal, iron, timber, mineral produce, &c., may safely be calculated upon. The country through which this line will run, is peculiarly level; it will be constructed at a proportionately low cost, and, doubtless, be made for the amount invested; the capital for carrying out this project is proposed to be 500,000/., in 20,000 shares.

EAST AND WEST OF ENGLAND JUNCTION RAILWAY.—The prospectus of this proposed railway, which we slightly noticed in a former Number, is now before the public; the object of the promoters being, to complete the communication across the island from the Bristol Channel to the North Sea. To effect this desirable end, it will not be necessary to form a new line at an enormous cost; but, by taking advantage of the lines already in operation, and those which are proposed to be executed, a thorough and complete communication will be effected by a new line of less than 100 miles in length—forming the shortest and most direct route for all the northern countries of Europe, and the eastern coast of England to the Bristol Channel, South Wales, and Ireland. The great risk of a sea voyage round the channels, would induce the proprietors of the great works in South Wales to send their merchandise for exportation to the north by this line, and its small cost of construction will enable them to be carried at a much lower rate. It will be seen, on reference to the map, that its route lies through a populous and fertile country in the counties of Gloucester and Oxfordshire, and at present quite unprovided with railway accommodation; commencing at Cheltenham, it will proceed by Chipping Norton, Stow on the Wold, to Banbury, where it will join the proposed Oxford and Rugby line, should it be carried into effect, and from thence to Blisworth, uniting at that place with the Northampton and Peterborough branch. A large portion of the agricultural produce of the east, midland, and western counties, must find its way along this line, as well as general produce from Ireland, coals and minerals from Wales and the Forest of Dean, cloth goods, the staple produce of Gloucestershire, and a large traffic in passengers must ensue from all parts of the kingdom. The capital proposed is 800,000/., and, from the present known increasing traffic at each of its termini, there is every reason to believe that the shareholders will receive a very handsome return for the capital laid out.

PROSSER'S GUIDE WHEELS.—We are pleased to see that the *Journal des Chemins de Fer*, and other French journals, have given a very long description of this clever invention, and paid Mr. Prosser the eulogium he justly deserves, at the same time recommending its adoption on the lines now forming throughout France.

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